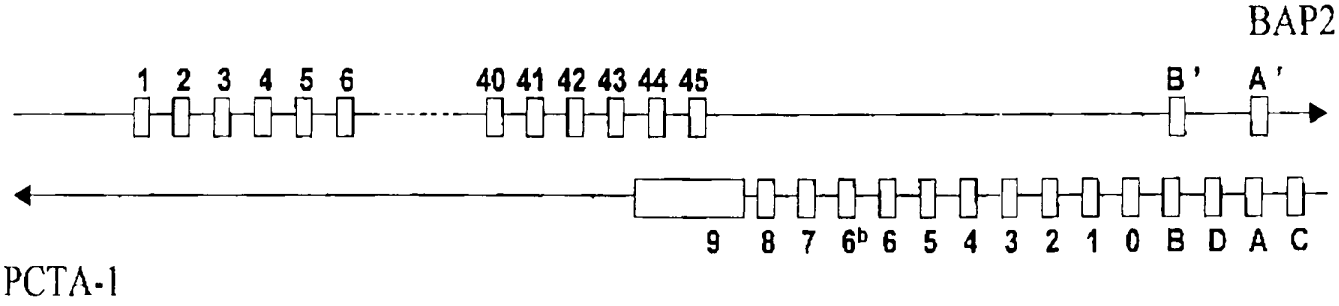


FIGURE 1

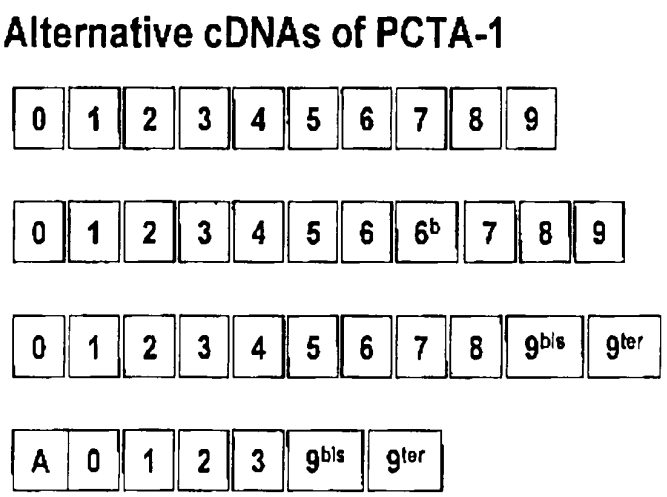

Alternative cDNAs of PCTA-1
0 1 2 3 4 5 6 7 8 9
0 1 2 3 4 5 6 6b 7 8 9
0 1 2 3 4 5 6 7 8 9bis 9ter
A 0 1 2 3 9bis 9ter
Alternative 5 'end of PCTA-1 cDNAs
C A ....
B 0 1 2 ....
A 1 2 ....
A D 0 1 2 ....

FIGURE 2

Figure 3

```
H       -MTSLAQQLQRLALPQSDASLLSRD----EVASLLFDPKEAATIDRDTAFAIGCTGLEEL
D       MSTALAQQLQKLAAPQSSVTLADAR----SRASILFDPKEAATKDRRSIYEIGLTGLQEL
A       MSSSIVSQLQALKSVLQADTEPSKRP--FTRPSILFSPKEAADFDIESIYELGLKGLEVL
S       MASSLQKQLKNIQSNNVLKINKIRR-----APSLLYDPKVAADMDLEEIYVTAVSGFHEL
Y       -MSSLSDQLAQVASNNATVALDRKRRQKLHSASLIYNSKTAATQDYDFIFENASKALEEL
C       MATSLTSQLENLRTSAARHLTVEKR-----HVSLLFDRKEANKLSNETAHRIGVAGLEQM
          ::: .**  :                    *:::. * *   .    .  .  .:. :

H       LGIDPSFE-QFEAPLFSQLAKTLERSVQTKAVNKQLDENISLFLIHLSPYFLLKPAQKCL
D       TDFNPAFK-EFQLTLFDEATLTLERSVELPEINKMLDAAIAKFLRLLSPYLLLRPAHMAF
A       GNKDERFK-NYMNDLFSHKSKEIDRELLGKEENARIDSSISSYLRLLSGYLQFRASLETL
S       AVHEPRLL-YFEKTLLGEQSVQVDRVLLNRTENEKIDLECVQILRLLAPFFTEKNALKVI.
Y       SQIEPKFA-IFSRTLFSESSISLDRNVQTKEEIKDLDNAINAYLLLASSKWYLAPTLHAT
C       KRIDPVFDTEFANDLFSEERVDFVRSMLEKGANEELNKQIEKLLLELSPYLQHFACQQVL
           :  :   :   *:..    . * :        ::      *   :

H       EWLIHRFHIHLYNQDSLIACVLPYHETRIFVRVIQLLKINNSKHR-WFWLLPVKQSGVPL
D       EWLLRRFQVHEYNRSEVMALILPYHETMIFVQIVKTMRLRSSDGD-WYWLRPLQRPGVPL
A       EYLIRRYKIHIYNLEDVVLCALPYHDTHAFVRIVQLLSTGNSK---WKFLDGVKNSGAPP
S       EWLIRRFSIHEYVSDEFILSFLPFHDHPFFARILGCSKPKSRP---LLFLENAIKMPVTL
Y       EWLVRRFQIHVKNTEMLLLSTLNYYQTPVFKRILSIIKLPPLF----NCLSNFVRSEKPP
C       EFLIHTYQIYSFNAETLLLTFLPFHETKVYSRLLRILDFDWKRSKEWQFMQQFTKTETPI
        *:*::  : ::    . .:   * :::   : :::                :    .   .

H       AKGTLITHCYK-DLGFMDFICSLVTKSVKVFAEYPGSSAQLRVLLAFYASTIVSALVAAE
D       AKTAIINRAAS-NPAFLGFICQSTQKAVKELGPR---AHQLQAQINFYATVVVGALQTAK
A       PRSVIVQQCIR-DKQVLEALCDYASR-TKKYQPS------KPV-VSFSTAVVVGVLGSVP
S       SRADIVHALSR-DKEFFAMFAQFVQNTAESHNMY-------PELAREWAGTMMEVLVAWH
Y       TALTMIKLFN--DMDFLKLYTSYLDQCIKHNATY-------TNQLLFTTCCFINVVAFNS
C       PFTSIARATLSSKHSIITCITDHIRHAVEIVGSD-YLEIKHPILFNFHAKLLLSMFTDPE
        .   :       .  .:    .   .  :                    * :  .:  .

H       D-VSDNIIAKLFPYIQKGLKS---SLPDYRAATYMIICQISVKVTMENTFVNSLASQIIK
D       P-LQDWHITTILESLLRGLIS---DNIDFMAAAYVIVAQLVSRTKLKSKVCNALLERVAN
A       T-VDGDIVKTILPFVDSGLQSGVKGCLDQQAGALMVVGMLANRAVLNTNLIKRLMRSIID
S       SSNEDPNVLLDRFFLRVSYAVSYVSSIDFQIAGFMLLSSIAASLPLSPSIIPPLVSAITD
Y       N-NDEKLNQLVPILLEISAKLLASKSKDCQIAAHTILVVFATALPLKKTIILAAMETILS
C       K-VDEMMLAKLMPFIENGIKS---PMKSFRYSAMVVISQLVLTVKLKDEVLNSMCKLLIT
           .          :  .         .   .   ::  :     :.  .       :

H       T-LTKIPSLIKDGLSCLIVLLQRQKPESLGKKPFPHLCNVPDLITILHGISE-TYDVSPL
D       CPFERLHSESLLLLVCIYGKQQAALP-HFKPETILNLVGKKWLISTLSSLAKGNIAIQSI
A       I--GREHAKE-----------SSDP-HSLRLSLMALINFVQLQSVDLIPRK--------
S       R----LSFDN-----------IKP---ALICVGHLLQFCSSFEFDHEQLE--------
Y       NLDAKEAKHS-----------ALLTICKLFQTLKGQGNVDQLPSKIFKLFD--------
C       K----MRSDT-------------------AAASLSTLMVVFQQQNVQSLSKN--------
                                        .          .

H       LRYMLPHLVVSIIHHVTG--EETEGMDGQIYKRHLEAILTKISLKNNLDHLLAS-LLFEE
D       CMPLMTGAVAAIRDDDASSNSCKLFLDNLLSEVPMPKPTAQQLINCFLDTYVETAIDAPE
A       ----ALDLFNEISSSDDK---CCEVLASIIETVP---------VSNLVDHLISK-VFSLC
S       K---LESFGASSLLIELS---QEHRLDEFFVSYW---------VS-----LIKS-RKQKD
Y       ----SKFDTVSILTFLDK--EDKPVCDKFITSYT---------RS--IARYDRS--KLNI
C       -------TLKKLLRHEEG--IDVWKILKELSERT---------DT-----TKFFNVLWKE
                                    :          .
```

Figure 3 (following)

```
H       YISYSSQEE-----MDSN-KVSLLNEQFLPLIRLLESK-YPRTLDVVLEEHLKEIAD--L
D       PMETNSNEDDDTIVIDSDDEIETEKTTFQAWYSTYLEK-LERRYPEAFDLSVKEALR--S
A       MTQYQKNSD-----FRSS----TSGSWAKKFLVVVSKK-YPAELRAAVPKFLEATEVQ-S
S       KKRLISLLD-----TSIS-QIRVTHEQAKFLLSVIPVN-QDFKALQSYRRILDSVIQP-E
Y       ILSLLKKIR-----LERY-EVRLIITDLIYLSEILEDKSQLVELFEYFISINEDLVLK-C
C       LIVLSKDAES----EDNTLAIDVLIETIEDASILTGDQ-AGTILKLILQEGMDGNIFDNK

H       KKQELFHQFVSLSTSGGKYQFLADSDTSLMLSLNHPLAPVRILAMNHLKKIMKTSKEG-V
D       KSSTSNRQKALKLALGFRLNTTDEKAKHAYEKLYHYSADWRLSAVQKLLQNLNVTKKRER
A       KKEDLKLEMLSCMLDGNSDMSHPFVDSKLWFRLHHPRAAVRCAALSSLNGVLKDDSSKAE
S       RKEGKLDNLINTLQDKKKSSTFSKKDREVLLKKIS-----EIDSQTSFEQCLAYADSAAD
Y       LKSLGLTGELFEIRLTTSLFTNADVNTDIVKQLSDPVETTKKDTASFQTFLDKHSELINT
C       KKLKSNIRAIGMRFAKQFDAIHAELKAKDKKTLKNVLKEYQIEDIVQFASEAVAATQSEE

H       DESFIKEAVLARLGDDNIDVVLSAISA-FEIFKEHFSSEVTISNLLNLFQRAELSKNGEW
D       SVKLLQECLPDRINDDSGAVVSTLLSLPTEELAEMLGPLPLAQTLCHLLYRAQSEKDEEW
A       NLVTIQDAILRQLWDDDLAVVQAALSF--DKLPNIITSSGLLDALLHVVKRCVGILVSGV
S       LDSSVFISLLSKFG-DKIPFLLFCIAN--------GSERIIILSLIELRKTIEENKDVDY
Y       TNVSMLTETGERYK-KVLSLFTEAIGK----G--YKASSFLTSFFTTLESRITFLLRVTI
C       SIEIISEEAPSSKK-IKLTASEKAQKL--AQ--SSEFAKREVFSGDPINKATEWLNGEKW

H       YEVLKIAADILIKEEILSENDQLSNQVVVCLLPFVVINNDDTESAEMKIAIYLSKSGICS
D       QPVVPLAVRHLTSALVSGSYD--TNLVLLALMPLLFPGEALAEHQHKALRILLG-SDFVS
A       SHNVQLAVDVVALSLKIAVSSFGNQTDSTEKVTSAMFPFLLIQPKTWNLNLLVLKLGKDV
S       QIILPVVLYSLQSKDTEVRSR-----ALNLILTFLELRN-----ENLEFSIIYG------
Y       SPAAPTALKLISLNNIAKYIN--S--IEKEVNIFTLVPCLICALRDASIKVRTG------
C       DKVEWALNEMAQRGEKYFSRK-----VEDDVEQFVLEIVKVVG--VGGVKQIDG------

H       LHPLLRGWEEALENVIKSTKPGKLIGVANQKMIELLAD-NINLGDPS-SMLKMVEDLISV
D       KVPFLA--ELKVSNKFSDFN----VGEHRQHFLDIIASSNQELSSQERALLQSVEDHG--
A       NWPLFK--NLAADDGMKKLP-----DIMSTNLSSISMDIINDLG----EALSLDPDER--
S       ----MD------DNDNKNLR-----WLSPVETKYYCSD--LLLD----------------
Y       ----VK----KILSLIAKRP-----STKHYFLSDKLYGENVTIP-----MLN--------
C       ----GS-----VKAALAGAN------LNPQFVADLLTK-FDGVS----------------

H       GEEESFNLKQKVTFHVILSVLVSCCSS-LKETHFPFAIRVFSLLQKKIKKLESVITAVEI
D       GELYIQKASQLTHLLLLLTAYAKRELQPRESLHMLEKIGLYSRRLQFRVVNGSQNTQNCA
A       RIELIERACNYKLSEVLETCSNIKCSE---QDRNKLQKGLLIRESVSALNIDVINKLVEA
S       RSSEIGLDGTYLFSYIPERLFTEKKPK-----NASKEIAVTSFLSSHAACSKLSNVRVLL
Y       PKDSEAWLSGFLNEYVTENYDISRILT-----PKRNEKVFLMFWANQALLIPSPYAKTVL
C       EIAPKRTKGAQKKNLVEKTFGTEESWE-----AFNQRVVFVLDLLNARQIIPSSEKVLAA

H       PSEWHIELMLDRGIPVELWAHYVEELNSTQRVAVEDSVFLVFSLK-KFIYALKAPKSFPK
D       PLQLYVDFLLT-LVKNTKWT----ALASTPWNQMTDELRLCLRLL-EIICAQVFSEKADQ
A       -------FMMH-PADYIQWL-------TTEWEELEVEVDVSLKELSKSNCQELLYQLLDT
S       ------------LEILTRV---------HGKVEDAKMQILLPRL--EQLSEFNSEKFKT
Y       ------------LDNLNKS-------PTYASSYSSLFEEFISHYLENRSSWEKSCIANK
C       ------------LFAVVKQVN-------SKSDVESSSYQQHLAVN-AIRKILEHPEKTKI
```

Figure 3 (following)

```
H       GDIWWNPEQLKEDSRDYLHLLIGLFEMMLNGADAVHFRVLMKLFIKVHLEDVFQLFKFCS
D       ------PERQ-EWTRALQQSLQLILPEAQ---D-----------RLEVLSNFYVFERLP
A       ------SDFTALNSKDVKAAAINCIEALFN---------------LRAA--IYGSSFDE
S       ----------VSKREVEALVNCFNHTS-----------------FTSLLSFLSSNI
Y       ----------TNFEHFERSLVNLVSPKE---------------KQSFMIDFVLSALNS
C       --------------GASEVDMDCVIETM---------------------RSTHNHH

H       VLWTYGSSLSNPLNCSVKTVLQTQALYVGCAMLSSQKTQCKHQLASISSPVVTSLLINLG
D       ELWPRDSDYA---------VFRLQGFIILEAVLSNPKSQIDCGLVHVLR-----VANACG
A       LLG---------------MIVQQRRLILSDNKFFA--SYLTSLLSSTTN----DLLVPVG
S       VLS-------------~---QAICRRIVEIOSHLKD--PQRLEFVKAVIS-------QDEQ
Y       DYEQ-LA----------NIAAERLISIFASLNN--AQKLKIVQNIVD----SSSNVES
C       LLR-----------------DCLRLIVAAAKHTP--NSVVKHVMSVFT------FMGNG

H       SPVKEVRRAAIQCLQALSG--VASPFYLIIDHLISKAEEITSD-AAYVIQDLATLFEELQ
D       SPLQTLRVQAINILQLISNRKLVSHVEQLVRSLLQRKSELSMDHEQYALILYTILEPEKA
A       LQKRFDQSTKENILSVILLCAEDLPAYGKLRVLSLLKDLGIMLMRDEIVKLLSQLLDK--
S       PHYYVDVLDSIKIPDTVFK-----KLIGSVRLVKEKNPAIAKR-----KRIDSHIFDG--
Y       SYDTVGVLQSLPLDSDIFVS---ILNQNSISNEMDQTDFSKRR-RRRSSTSKNAFLKEEV
C       MLRKDNELTLSIVEKTVES------LFSTIINSSGQAVLTKQQ-QTEKLIELARLFAASA

H       REKKLKSHQKLSETLKNLLSCVYSCPSYIAKDLMKVLQGVNGEMVLSQLLPMAEQLLEKI
D       TAKERLVLSKLKRSVLALASDPKQSP-ICTASLLAALKHVNDENFLNELLPLGLDSLKTI
A       RSQYYYKLDKTSQPLSDTEVDLLCLLLECSMMRTSSFKGQS----LDDHILSALNVDCMA
S       ------DVQRLTRILELLETKNAASYPKLASPLFEVLNSVIA---LKEDIVSSNYLLQLL
Y       SQLAELHLRKLTIILEALDKVRNVGSEKLLFTLLSLLSDLET---LDQDGGLPVLYAQET
C       IDIPAHRRARIAQAIARAVQAENAST--VVLVLVSSFCARWQ---RSSDAAAQEAMKRGS

H       QK-EPTAVLKDEAMVLHLTLGKYNE-FSVSLLNEDPKSLDIFIKAVHTTKELY-AGMPTI
D       TAGEDNQNIKQLPWPHSEIYKSVIERFEGRVALNVLLRKDLAWKLFEDSFAQY-DTYVQL
A       SE-RPAVISPCLTILEKLSNRFYDE----LQT-------DVQIRFFHKLVSMFRSSNGSI
S       LG-------LLYEMIGASPITELSP-------------SIRIDTLVGCIRST--NNPQI
Y       LI---SCTLNTITYLKEHGCTELTN---------------VRADILVSAIRNS--ASPQV
C       DQ-------DAYDDLAIELLSALNP-------------FEQLSSVLEMCEYVRRLGGDK

H       QITALEKITKPFFAAISDEKVQQKLLRMLFDLLVNCKNSHCAQTVSSVFKGIS-VNAEQV
D       EQ-KLQPLPCVLLNSLTPETFEQMHAKHKIALIKLIVESATNSDNDSIFLASH-RLLKRC
A       QNGAKEAVLRLKLSSSTVVLALDRITQQDTLVIGSLSKKKKQKKNSKSCPEED-INSEEF
S       QN--KALLLVSALANAAPEAVLHGVMPIFTFMGSTVLSRDDAFSIHVIEQTVKTVISALI
Y       QN--KLLLVIGSLATLSSEVILHSVMPIFTFMGAHSIRQDDEFTTKVVERTILTVVPALI
C       PA--KSTTTKKDLDTMIFDRTAQTLPRIRHFRYVVVTLISRIFSNRVLIERLAAYDDEEL

H       RIELEPP-DKAKPLGTVQQKRRQK-MQQKKSQDLESVQEVGGS-Y-WQRVTLILELLQHK
D       RLDCQP---LVPILLEMANTKVEK-KQPVKRRSVQATQLDLTSPY-WKQGMTLLELLEHK
A       RSGEKAL-SFIASLLDMLLLKKDLTHRESLIRPLFKLLQRSMSKE-WVKIAFSIEETSLQ
S       RLGKDF---DSSLLVSCFVNAFPHIPQHRRLRLYRLVLQTIGS----NRFLSVVLIQFAE
Y       KNSKGNEKEEMEFLLLSFTTALQHVPRHRRVKLFSTLIKTLDPVKALGSFLFLIAQQYSS
C       LKNALP---LGKRLIECSVELDEFANKEANDQDGSDPQAQRYWVAFASRTEVVSEKLRHL
```

Figure 3 (following)

```
H       XKLRSPQILVPTLFNLLSRCLEPLPQEQGNMEYTKQLILSCLLNICQKLSPDGGKIPKDI
D       KQLVGAELLIPPLFELLQACLT--MEEHSAAEYPKQLILSSLLHCCQTAQSAGVQLVKAM
A       PPQ-DVRETTPTFISSIQQTLL-------------LILKDIFDSLNMN-PLKAEVANEI
S       KML---LAKSTNVVAIHDFCLT-------------------L--VQSF-----SVADRI
Y       ALVNFKIGEARILIEFIKALLV-------------D-------LHVNEELS--G--LNDLL
C       LPG---GVAARLIADVLQECVN-------------------------DKK------MSYKM
                  .    .  :                              :         :   :

H       LDEEKFNVELIVQCIRLSEMPQTHHHALLLLGTVAGIFPDKVLHNIMSIFTFMGANVMRL
D       P-ESSFRIELVVQSLRNTRNPQTQQHALLFLTHCAGMYPQQVLHKIVEIFTFVGSTVARH
A       N-------VKMLVELAHSSNDGVTRNHIFSLFTAIVKFVPDKVLDHIISILTLVGESTVTQ
S       C--------SIN-QCSRFCLKSLEEQSNSDSNGKAVSLIKLDELPMDVDLATLGSLRVKVL
Y       D------IIKLLTSSKSSSEKKKSLESRVLFSNGVLNFSESEFLTFMNNTFEFIN-KITEE
C       C--------EKVLQLANIKLG------HDRYLFA-DSGINEKELITLAQALNKFIVAETKSE
                  .    .                          :    . :         :

H       DDTYSFQVINKTVKMVIPALIQSDSGDSIEVSRNVEEIVVKIISVFVDALPHVPEHRRLP
D       DDAFSLHIIHNVVESIIPILLLN-TG--------HNELVIPVLKVFADICTDVPVHRRLP
A       IDSHSKSIFEGFISMVIPFWLSK-------------TKSEEQLLQIFVKVLPDIVEHRRRS
S       ELISLVSKAKNFAFDLAKIMENS-----------------VDSFVEIQAGLFES--IK
Y       TDQDYYDVRRNLRLKVYSVLLDETSD---------KKLIRNIREEFGTLLEGVLFF-INS
C       EKMRMCQNSAYTLKLIAKNLPSQ-----------------SESLVLADTMQR-CVS
                        :      .

H       ILVQLVDTLGAEKFLWILLILLFEQYVTKTVLAAAYGEKDAILEADTEFWFSVCCEFSVQ
D       LYATLFRVLEPKEHLWQFLCIIFES----QVLLEQVPQKVSTDKSRLDFARELTLMFEDP
A       IVAYLLGVVTS----------------------LLQQ--------------------------
S       LLITLSQQSSNE-------------------MELG-------------------------
Y       VELTFSCITSQE-------------------NEEAS-----------------------
C       IVSQYQKLDEN-------------------------------------------------
        :

H       -HQIQSLMNILQYLLKLPEEKEETIPKAVSFNKSESQEEMLQVFNVETHTSKQLRHFKFL
D       TVAIQTCIRLLDYLAKLPATKSSLSGGSGSSVLSTEQ----QLFDVRTRTFKQLRHYKYL
A       ----QTDYNGTKKVLGLISERAKDTS---SS-----------------KMKHKRKI
S       ----HVYVALRSVIHLLPNELFCTVLG----------------------KLLHDERA
Y       ----DSETSLSDHTTEIKEILFKVLGN-------------------VLQILPVDEFV
C       ----------LTGNVLLLAGELIRS-------------------------HNMRS
                        :

H       SVSFMSQLLSSNNFLKKVVESGGPEILKGLEERLLETVLGYISAVAQSMERNADKLTVK-
D       IMDFLSGISSCNEWEKKMKRPDPNELLPYYQEFILKT-LAYVGVLNGALEAASETPSLEK
A       S----------N--QK-----GRN----------------------S------------
S       LLR----------RK------ALS--------------------IVQ------------
Y       NAVLPLLSTSTNEDIR-------YHLT---------------LVIGS------------
C       T-------------------------------------------I------------

H       FWRALLSKAYDLLDKVNALLPTETFIPVIRGLVGNPLPSVRRKALDLLNNKLQQNISWKK
D       FWRVLANHAHDVLDNAIGLLAPQHFISVITELLKHDHVYVRIKVMDLLVTKLSPSSDYFQ
A       -WLNLDEVAVDSFGKMCEEIV--HLINATDDESGVPVKRAAISTLEVLAGRFP----SGH
S       -QRVQQGSKVSALTALIPDVT--YNISNYSDE---ETTQLAMDCLAVMAKRFS-------
Y       KFELEGSEAIPIVNNVMKVLL--DRMPLESKS--VVISQVILNTMTALVSKYG-------
C       -----H-HATSLLKTCLATVQ--ECIARFSKP---QYDSAASPGSSVAGGRGN-------
                  .      :     :                          :
```

Figure 3 (following)

```
H       -TIVTRFLKLVPDLLAIVQ--RKKKEGEEEQAINRQTALYTLKLLCKNFGAENPDPFVPV
D       QSNAEHFGVLFAPLQEIINGILEGSSNSAQQAKLQQTALHALQLLALRHGRDYIEECRSL
A       ----PIFRKCLAAVAECIS-----------------------SKNLGVS--SSCLRT
S       -----ASPELFISPIEVVS-----------------------GPYGLKN-SARDVQ
Y       ---KKLEGSILTQALTLAT-----------------------EKVSSD---MTEVK
C       ------RG-HRIRQQSLGG-----------------------NKFGSD-----TLL

H       LSTAVKLIAPERKEEKNVLGSALLCIAEVTSTLEALAIPQLPSLMPSLLTTMKN----TS
D       LATLTKITKRRANVPKAVVGNVVLTLVEICASLKAHALAQLPKFAPQLTELLKEQVHQMA
A       TGALINVLG-----PKALIELPCIMKNLVKQSLEVSFASQS---G-------RN-------
S       VSAIVCITV-----LTNTLAARILPYLADIVNYSLSILDDAR----------KD-------
Y       ISSLALITN-----CVQVLGVKSIAFYPKIVPPSIKLFDASLADS-------SN-------
C       ICSLTCIQR-----VYDQFASFVVESTGDVIIRYCRLIARFG----------D-------

H       ELVSSEVYLLSALA-ALQKVVETLPHFISPYLEGILS----QVIHLEKITSEMGSASQAN
D       SLKQGPDYVCSTLVTALHKLFKALPLFLGPYLVDIIGGLARLSVQLENPQLLQDKRTQVL
A       ATAEEQLLMLSVLV-TLEAVIDKLGGFLNPHLGDIMK------IMVLHPEYVSDFDKNLK
S       --PEGDLLELACFS-MMIDFFKVLPEFSSSYVEPTIK---------CALASDRAFEHDAI
Y       --PLKEQLQVAILL-LFAGLIKRIPSFLMSNILDVLH----------VIYFSREVDSSIR
C       ---PSELLALNQPS--SSTTAAFQGGSQTSGFGSKTG---------IHHRLSLIRRSLLS

H       IR-LTSLKKTLATTLAPRVLLPAIKKTYK-QIEKNWKNHMGPFMS-ILQEHIGAMKKEEL
D       KQKLADVWSAVAQGVEVRILVPSCAKAFSSLLEQQAYDELGHLMQQLLLQSVRHNSAAQL
A       SK-ANAIRRLLTDKIPVRLTLQPLLRIYNEAVSSGNASLVIAFNM--LEDLVVKMDRSSI
S       GE---LLFETIANFIPTRLLMKSIFAAWPECARLGSTAALRLLEL--IELALQNSSRSAI
Y       LS----VISLIIENIDLKEVLKVLFRIWSTEIATSNDTVAVSLFLSTLESTVENIDKKSA
C       IE----LRVLPAHIVKTVGELKTEKKALS--ALFNLLTGYIETQH--Q-QKPEILRKSVI

H       TSHQSQLTAFFLEALDFRAQHSEN--DLEEVGKTENCIIDCLVAMVVKLSEVTFRPLFFK
D       QPVQDPLSELFLQALNFRLQVRGLGLQRQLVSDVEASITETFVTWILKLSETSFRPMYSR
A       VSSHGKIFDQCLVALDIRRLNPAA---IQNIDDAERSVTSAMVALTKKLTESEFRPLFIR
S       GTVYKSIFKFFLDSFDSRRSLLFA----EDVDNVETQAVNVFLKFVMKLSDTTFRPLFLH
Y       TSQSPIFFKLLLSLFEFRSISSFD--N-NTISRIEASVHEISNSYVLKMNDKVFRPLFVI
C       QLRRTFVSDVITPTLIVRSQERQSD-QFENVEKLEHTVFNFVISIASILSEVEFRTVVNE

H       LFDWAKTEDAP----K----DRLLTFYNLADCIAEKLKGLFT----LFAGHLVKPFADTL
D       VHKWALESTSR----E----TRLTYFL-LTNRIAEALKSLFV----LFASDFVEDSSRLL
A       SIDWAESDVVDGSGSENKSIDRAISFYGLVDRLCESHRSIFVPYFKYVLDGIVAHLTTAE
S       LHSWALEDLYETD--PSGIVSRQTFFYNFLTIFLDTLKSIVT-------N-YYAYVLDDT
Y       LVRWAFDGEGVTN-AGITETERLLAFFKFFNKLQENLRGIIT----SYFTYLLEPVDMLL
C       LVAWAEPGLEAKA--DLAARLRLVSLLHFANDLYTSFNSLALP----YFGRILEISALVL

H       DQVNISKTDEAFFDSENDPE--KCCLLLQFILNCLYKIFLFDT--QHFISKERAGALMMP
D       TEHNSIRPEFEVEEREDD------VDLLMAILNTLHHVFLYCS--EDFINDHRFNVLMPP
A       ASVSTRKKKKAKIQQTSDSIQPKSWHLRALVLSCLKNCFLHDTGSLKFLDTNNFQVLLKP
S       IELLSSK-D------TNS------EVR-HLVNSSLVSAFENDT-EEFWMVPARFGKISPV
Y       KRFISKD-------MEN--------VNLRRLVINSLTSSLKFDR-DEYWKSTSRFELISVS
C       KKCNATLLLGTDELLLSGKRGSIEALETDLALTLAIDVISNAARHRDFFTVDRCQLVSDV
```

Figure 3 (following)

```
H       LVDQLENRLG-GEEKFQERVTKHLIP-----CIAQFSVAMADDSLWKPLNYQILLKTRDS
D       LVNQLENDLVLGNESLQQVLSN---------CIAQFAVATN-DVMWKQLNSQVLLKTRTS
A       IVSQLVVEPPSSLKEHPHVPSVDEVDDLLVSCIGQMAVASGSDLLWKPLNHEVLMQTRSE
S       LIEQIQYAPLLDDKVLVKAIVE----------L-ASVASS-SDNFRSMNTQLLQYLRSS
Y       LVNQLSNIENSIGKYLVKAIGA----------LASNNSGVDEHNQILNKLIVEHMKAS
C       IVNELVNTKVEGHEKRCSDHLVP----------AIYRIGNADPDSFPELLNKIMLKTRDS
        :::::         :                                :   ::   : .

H       SP-KVRFAALITVLALAEKLKENYIVLLPESIPFLAELMEDECEEVEHQCQK-TIQQLET
D       NP-EVRILAFNSCVAIARKLGESYAALLPETVPFIAELLEDEHQRVEKNTRT-GVQELET
A       SV-RSRMLSLRSVKQMLDNLKEEYLVLLAETIPFLAELLEDVELSVKSLAQD-IIKQMEE
S       NI-NARLLAIQIQTQLYGRLGENWISTLPQSVPFIAELMEDDDDQVETATAE-LVRIIDD
Y       CSSNEKLWAIRAMKLIYSKIGESWLVLLPQLVPVIAELLEDDDEEIEREVRTGLVKVVEN
C       RA-KIRYRALIVLELLIKEIGDGVQPHLSILLPFLNELIEDENKQVEAQCQK-VINSLQH
           . :  ::      :  .: :     *.  :*.: **:**    ::       :. ::

H       VLGE--PLQSYF---
D       ILGE--SVQKYL---
A       MSGE--SLAEYL---
S       RLGENESLQDYLT--
Y       VLGE--PFDRYLD--
C       KFGE--TFWSGGSSA
          **   .:.
```

HEAT REPEAT

Figure 4

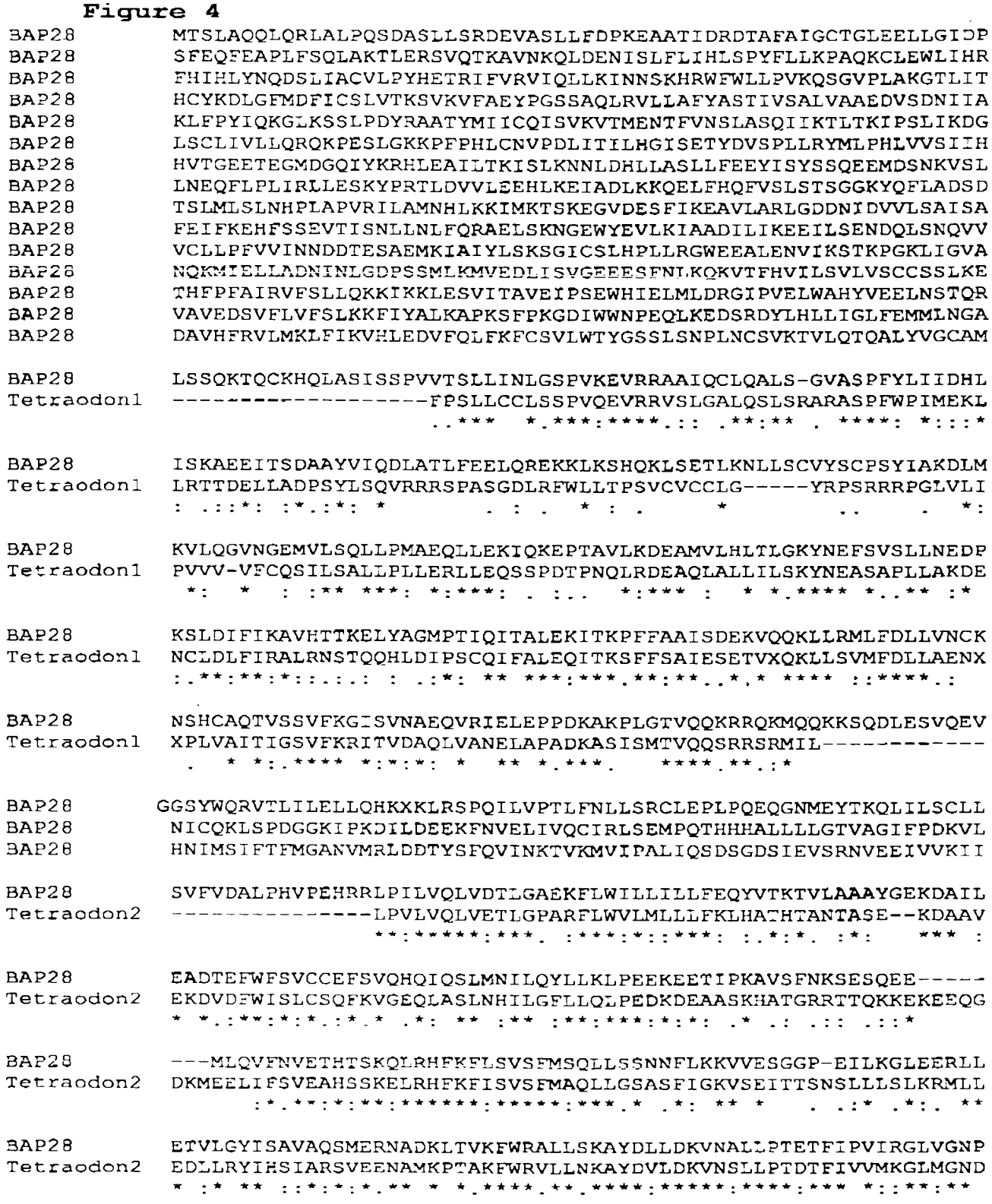

BAP28 MTSLAQQLQRLALPQSDASLLSRDEVASLLFDPKEAATIDRDTAFAIGCTGLEELLGIDP
BAP28 SFEQFEAPLFSQLAKTLERSVQTKAVNKQLDENISLFLIHLSPYFLLKPAQKCLEWLIHR
BAP28 FHIHLYNQDSLIACVLPYHETRIFVRVIQLLKINNSKHRWFWLLPVKQSGVPLAKGTLIT
BAP28 HCYKDLGFMDFICSLVTKSVKVFAEYPGSSAQLRVLLAFYASTIVSALVAAEDVSDNIIA
BAP28 KLFPYIQKGLKSSLPDYRAATYMIICQISVKVTMENTFVNSLASQIIKTLTKIPSLIKDG
BAP28 LSCLIVLLQRQKPESLGKKPFPHLCNVPDLITILHGISETYDVSPLLRYMLPHLVVSIIH
BAP28 HVTGEETEGMDGQIYKRHLEAILTKISLKNNLDHLLASLLFEEYISYSSQEEMDSNKVSL
BAP28 LNEQFLPLIRLLESKYPRTLDVVLEEHLKEIADLKKQELFHQFVSLSTSGGKYQFLADSD
BAP28 TSLMLSLNHPLAPVRILAMNHLKKIMKTSKEGVDESFIKEAVLARLGDDNIDVVLSAISA
BAP28 FEIFKEHFSSEVTISNLLNLFQRAELSKNGEWYEVLKIAADILIKEEILSENDQLSNQVV
BAP28 VCLLPFVVINNDDTESAEMKIAIYLSKSGICSLHPLLRGWEEALENVIKSTKPGKLIGVA
BAP28 NQKMIELLADNINLGDPSSMLKMVEDLISVGEEESFNLKQKVTFHVILSVLVSCCSSLKE
BAP28 THFPFAIRVFSLLQKKIKKLESVITAVEIPSEWHIELMLDRGIPVELWAHYVEELNSTQR
BAP28 VAVEDSVFLVFSLKKFIYALKAPKSFPKGDIWWNPEQLKEDSRDYLHLLIGLFEMMLNGA
BAP28 DAVHFRVLMKLFIKVHLEDVFQLFKFCSVLWTYGSSLSNPLNCSVKTVLQTQALYVGCAM
BAP28 LSSQKTQCKHQLASISSPVVTSLLINLGSPVKEVRRAAIQCLQALS-GVASPFYLIIDHL
Tetraodon1 ----------FPSLLCCLSSPVQEVRRVSLGALQSLSRARASPFWPIMEKL
BAP28 ISKAEEITSDAAYVIQDLATLFEELQREKKLKSHQKLSETLKNLLSCVYSCPSYIAKDLM
Tetraodon1 LRTTDELLADPSYLSQVRRRSPASGDLRFWLLTPSVCVCCLG-----YRPSRRRPGLVLI
BAP28 KVLQGVNGEMVLSQLLPMAEQLLEKIQKEPTAVLKDEAMVLHLTLGKYNEFSVSLLNEDP
Tetraodon1 PVVV-VFCQSILSALLPLLERLLEQSSPDTPNQLRDEAQLALLILSKYNEASAPLLAKDE
BAP28 KSLDIFIKAVHTTKELYAGMPTIQITALEKITKPFFAAISDEKVQQKLLRMLFDLLVNCK
Tetraodon1 NCLDLFIRALRNSTQQHLDIPSCQIFALEQITKSFFSAIESETVXQKLLSVMFDLLAENX
BAP28 NSHCAQTVSSVFKGISVNAEQVRIELEPPDKAKPLGTVQQKRRQKMQQKKSQDLESVQEV
Tetraodon1 XPLVAITIGSVFKRITVDAQLVANELAPADKASISMTVQQSRRSRMIL----------
BAP28 GGSYWQRVTLILELLQHKXKLRSPQILVPTLFNLLSRCLEPLPQEQGNMEYTKQLILSCLL
BAP28 NICQKLSPDGGKIPKDILDEEKFNVELIVQCIRLSEMPQTHHHALLLLGTVAGIFPDKVL
BAP28 HNIMSIFTFMGANVMRLDDTYSFQVINKTVKMVIPALIQSDSGDSIEVSRNVEEIVVKII
BAP28 SVFVDALPHVPEHRRLPILVQLVDTLGAEKFLWILLILLFEQYVTKTVLAAAYGEKDAIL
Tetraodon2 ----------LPVLVQLVETLGPARFLWVLMLLLFKLHATHTANTASE--KDAAV
BAP28 EADTEFWFSVCCEFSVQHQIQSLMNILQYLLKLPEEKEETIPKAVSFNKSESQEE-----
Tetraodon2 EKDVDFWISLCSQFKVGEQLASLNHILGFLLQLPEDKDEAASKHATGRRTTQKKEKEEQG
BAP28 ---MLQVFNVETHTSKQLRHFKFLSVSFMSQLLSSNNFLKKVVESGGP-EILKGLEERLL
Tetraodon2 DKMEELIFSVEAHSSKELRHFKFISVSFMAQLLGSASFIGKVSEITTSNSLLLSLKRMLL
BAP28 ETVLGYISAVAQSMERNADKLTVKFWRALLSKAYDLLDKVNALLPTETFIPVIRGLVGNP
Tetraodon2 EDLLRYIHSIARSVEENAMKPTAKFWRVLLNKAYDVLDKVNSLLPTDTFIVVMKGLMGND

Figure 4 (following)

```
BAP28         LPSVRRKALDLLNNKLQQNISWKKTIVTRFLKLVPDLLAIVQRKKKEGEEEQAINRQTAL
Tetraodon2    LPSVRRKAMELLNNKL----------------------------------------------
              ********::******

BAP28
   YTLKLLCKNFGAENPDPFVPVLSTAVKLIAPERKEEKNVLGSALLCIAEVTSTLEALAIPQLPSLMPSL
BAP28         LTTMKNTSELVSSEVYLLSALAALQKVVETLPHFISPYLEGILSQVIHLEKITSEMGSAS
BAP28         QANIRLTSLKKTLATTLAPRVLLPAIKKTYKQIEKNWKNHMGPFMSILQEHIGAMKKEEL
BAP28         TSHQSQLTAFFLEALDFRAQHSENDLEEVGKTENCIIDCLVAMVVKLSEVTFRPLFFKLF

BAP28         DWAKTEDAPKDRLLTFYNLADCIAEKLKGLFTLFAGHLVKPFADTLDQVNISKTDEAFFD
Tetraodon3    ----------------------------------------------------------EVLFE
                                                                         *.:*:

BAP28         SENDPEKCCLLLQFILNCLYKIFLFDTQHFISKERAGALMMPLVDQLENRLGGEEKFQER
Tetraodon3    SSHADQKVALXLQYVLXCLHKIFLYDTQRFLSKERADTLMNPLLDQLENTAGGPQTYQQR
              *.:  :* .* **::* **:****:***:*:*****.:** **:*****  ** :.:*:*

BAP28         VTKHLIPCIAQFSVAMADDSLWKPLNYQILLKTRDSSPKVRFAALITVLALAEKLKENYI
Tetraodon3    VTQHLVPCLGQFAVALADDTQWKTLNYXXXLKSRHSDAKVRFSSLLMLMXLTSKLKENYM
              **:**:**:.**:**:***: **.***   **:*.*..****::*: :: *:.******:

BAP28         VLLPESIPFLAELMEDECEEVEHQCQKTIQQLETVLGEPLQSYF
Tetraodon3    VLLPETIPFLAELME-----------------------------
              *****:*********
```

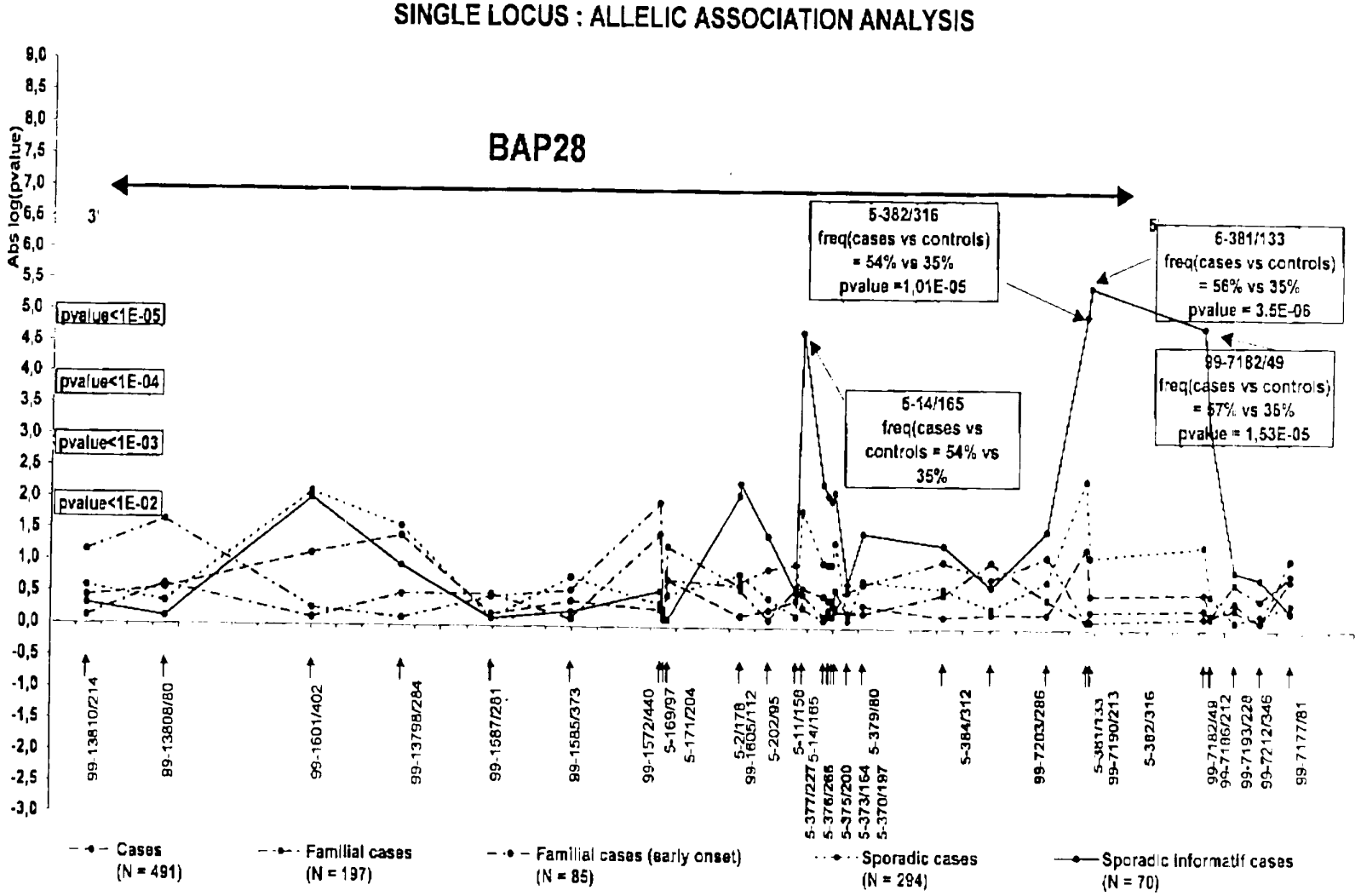

SINGLE LOCUS : ALLELIC ASSOCIATION ANALYSIS
BAP28
Abs log(pvalue)
pvalue<1E-05
pvalue<1E-04
pvalue<1E-03
pvalue<1E-02
5-382/316
freq(cases vs controls)
= 54% vs 35%
pvalue =1,01E-05
6-381/133
freq(cases vs controls)
= 56% vs 35%
pvalue = 3.5E-06
99-7182/49
freq(cases vs controls)
= 57% vs 35%
pvalue = 1,53E-05
6-14/165
freq(cases vs
controls = 54% vs
35%
Cases
(N = 491)
Familial cases
(N = 197)
Familial cases (early onset)
(N = 85)
Sporadic cases
(N = 294)
Sporadic informatif cases
(N = 70)

Figure 5

SINGLE LOCUS : GENOTYPIC ASSOCIATION ANALYSIS

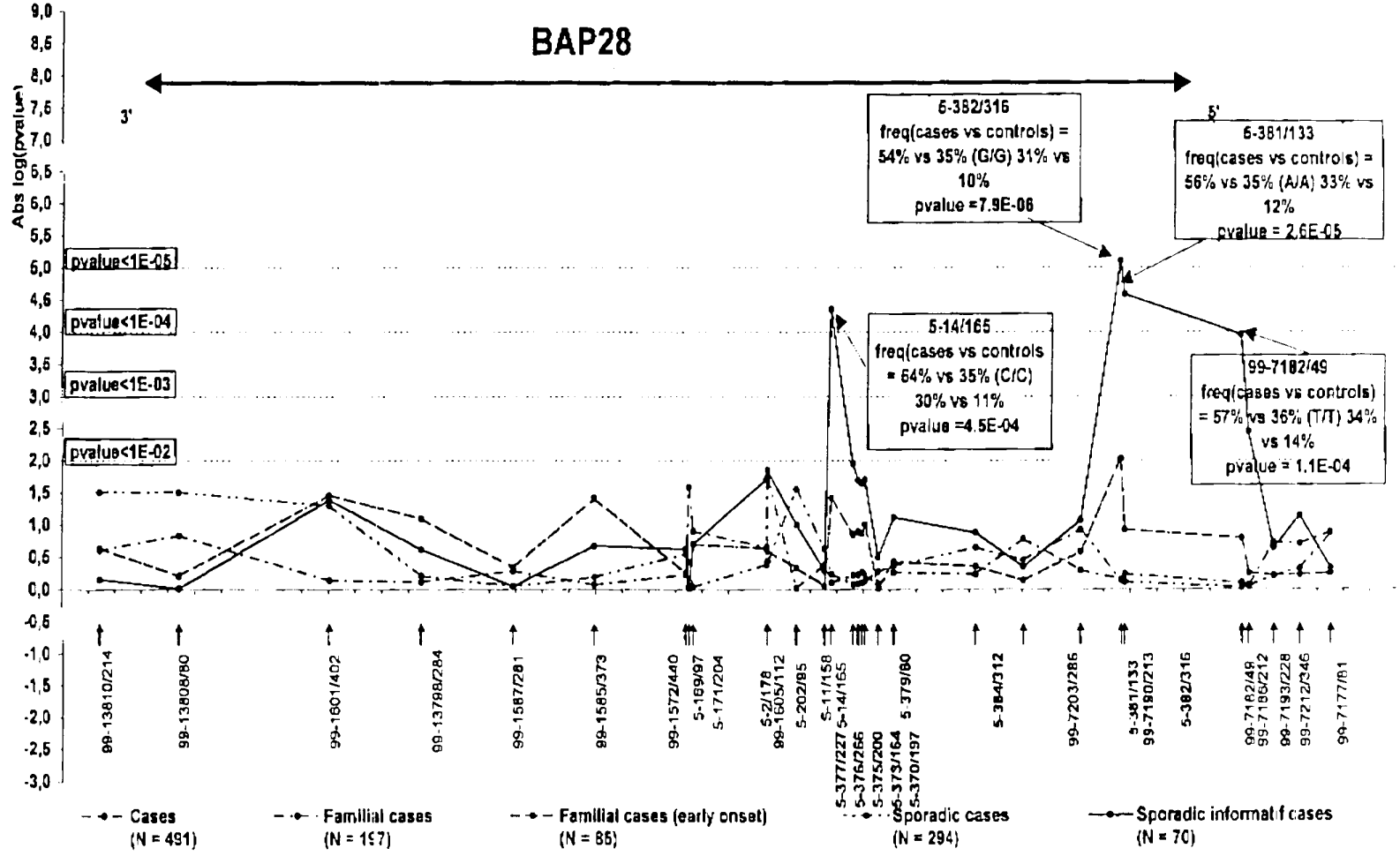


Figure 6

HAPLOTYPE ANALYSIS SORTED BY INDIVIDUAL HAPLOTYPE TEST (2 markers)

491 CASES vs 313 CONTROLS

MARKERS		99-1601/402	99-13798/284	5-377/227	5-376/266	5-375/200	5-373/164	5-382/316	5-381/133	99-7182/49	HAPLOTYPE FREQUENCY TEST						OMNIBUS LR TEST			
POLYMORPHISM		A/T	A/G	A/G	A/G	A/G	C/T	C/G	A/G	C/T	Estimation frequency of haplotype			Statistical test			Likelihood Ratio	omnibus test		
cases / controls		480 vs 305	423 vs 278	449 vs 307	453 vs 298	455 vs 307	433 vs 298	448 vs 304	446 vs 304	415 vs 287										
frequency % (case/controls)		37/32 (T)	58/53 (A)	33/31 (G)	33/31 (A)	33/31 (A)	34/31 (T)	39/34 (G)	37/34 (A)	39/36 (T)										
diff freq all(cases-controls)		4,4	5,6	2,4	2,2	1,8	2,8	4,9	2,6	2,9										
pvalue		7,40E-02	3,80E-02	3,20E-01	3,70E-01	4,40E-01	2,50E-01	5,40E-02	2,90E-01	2,70E-01	cases (%)	control (%)	difference	Odds ratio	pvalue (1df)	Nb of permut	LR Test	Pvalue (3 df)	Pvalue (100 permut)	
Odds ratio		1,20	1,20	1,10	1,10	1,10	1,10	1,20	1,10	1,10										
Test Hardy Weinberg	cases vs controls	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0,03	0.02										
		0.01	0.00	-0.02	-0.02	-0.02	-0.01	-0.02	0.01	0.01										
haplotype 1	441 vs 301	T		G							15,60	9,30	6,3	1,80	3,90E-04	0/100	10,10	1,70E-02	5,00E-02	S
haplotype 2	398 vs 269		A					T			20,30	12,80	7,4	1,73	3,80E-04	0/100	11,51	8,90E-03	2,00E-02	S
haplotype 3	416 vs 270		A		A						19,80	12,50	7,3	1,73	4,10E-04	0/100	11,30	1,00E-02	1,00E-02	S
haplotype 4	440 vs 298	T						G			17,20	10,60	6,6	1,75	4,30E-04	0/100	9,81	1,90E-02	1,00E-02	S
haplotype 5	387 vs 264		A							T	23,00	15,40	7,6	1,64	7,30E-04	0/100	10,19	1,70E-02	1,00E-02	S
haplotype 6	447 vs 301	T				A					15,20	9,30	5,9	1,75	8,20E-04	0/100	9,13	2,70E-02	2,00E-02	S
haplotype 7	425 vs 292	T						T			15,80	9,70	6,1	1,75	8,20E-04	0/100	8,79	3,20E-02	3,00E-02	S
haplotype 8	445 vs 292	T			A						15,10	9,30	5,6	1,75	9,10E-04	1/100	9,12	2,70E-02	4,00E-02	S

Figure 7A

HAPLOTYPE ANALYSIS SORTED BY INDIVIDUAL HAPLOTYPE TEST (3 markers)

491 CASES vs 313 CONTROLS

MARKERS	99-1601/402	99-13798/284	99-1587/281	5-169/97	5-2178	99-1605/112	5-14/165	5-377/227	5-376/266	5-375/200	5-373/164	99-7203/286	5-382/316	99-7182/49	99-7188/212	99-7193/228	99-7212/348
POLYMORPHISM	A/T	A/G	A/G	C/G	C/T	A/G	C/T	A/G	A/G	A/G	C/T	C/T	C/G	C/T	A/G	C/G	C/T
cases / controls	480 vs 305	423 vs 278	410 vs 288	471 vs 305	470 vs 306	476 vs 304	478 vs 307	449 vs 307	453 vs 288	455 vs 307	433 vs 288	356 vs 257	446 vs 304	415 vs 287	433 vs 282	349 vs 250	347 vs 259
frequency % (case/controls)	37/32 (T)	58/53 (A)	33/32 (A)	82/82 (C)	32/31 (T)	32/31 (A)	37/34 (C)	33/31 (G)	33/31 (A)	33/31 (A)	34/31 (T)	69/68 (T)	39/34 (G)	39/38 (T)	35/33 (G)	61/59 (C)	67/66 (C)
diff freq all(cases-controls)	4,4	5,6	1,0	0,3	1,0	1,0	2,9	2,4	2,2	1,8	2,8	1,4	4,9	2,9	1,2	1,8	0,6
pvalue	7,40E-02	3,80E-02	8,80E-01	7,50E-01	8,60E-01	8,60E-01	2,40E-01	3,20E-01	3,70E-01	4,40E-01	2,50E-01	5,80E-01	5,40E-02	2,70E-01	5,80E-01	4,80E-01	7,50E-01
Odds ratio	1,20	1,20	1,00	1,00	1,00	1,10	1,10	1,10	1,10	1,10	1,10	1,10	1,20	1,10	1,10	1,10	1,00
Test Hardy Weinberg: cases vs controls	0,00	0,00	-0,02	-0,00	-0,00	0,00	0,01	0,00	0,00	0,00	0,00	-0,00	0,01	0,02	-0,00	0,02	0,02
	0,01	0,00	0,01	-0,01	-0,02	-0,01	-0,01	-0,02	-0,02	-0,02	-0,01	-0,02	-0,02	0,01	0,00	0,02	-0,00

HAPLOTYPE FREQUENCY TEST — Estimation frequency of haplotype: cases (%), controls (%), difference; Statistical test: Odds ratio, pvalue (1df), Nb of permut

OMNIBUS LR TEST — Likelihood Ratio: LR Test, Pvalue (7 df); omnibus test: Pvalue (100 permut)

		cases (%)	controls (%)	difference	Odds ratio	pvalue (1df)	Nb of permut	LR Test	Pvalue (7 df)	Pvalue (100 permut)	
haplotype 435	385 vs 278	5,30	0,00	5,3	100,00	3,30E-08	0/100	19,30	7,30E-03	1,00E-02	S
haplotype 436	278 vs 236	5,70	0,00	5,7	100,00	1,30E-07	0/100	15,47	3,00E-02	2,00E-02	S
haplotype 437	286 vs 293	5,50	0,00	5,5	100,00	2,80E-07	0/100	14,61	4,00E-02	1,00E-02	S
haplotype 438	382 vs 274	5,70	0,60	5,1	9,80	9,10E-07	0/100	16,83	1,80E-02	3,00E-02	S
haplotype 439	432 vs 265	14,90	6,80	8,3	2,45	1,20E-06	0/100	18,51	9,50E-03	1,00E-02	S
haplotype 440	368 vs 268	5,80	0,80	5,0	7,99	2,30E-06	0/100	13,20	6,70E-02	2,00E-02	S
haplotype 441	387 vs 281	5,40	0,70	4,7	8,59	2,50E-06	0/100	15,79	2,70E-02	1,00E-02	S
haplotype 442	436 vs 285	14,50	6,60	7,9	2,39	3,00E-06	0/100	17,28	1,60E-02	4,00E-02	S
haplotype 443	436 vs 286	14,50	6,60	7,9	2,41	3,50E-06	0/100	17,79	1,30E-02	4,00E-02	S
haplotype 444	400 vs 278	6,30	1,20	5,1	5,82	3,90E-06	0/100	15,74	2,70E-02	2,00E-02	S
haplotype 445	394 vs 277	5,10	0,70	4,4	8,19	5,70E-06	0/100	13,66	5,70E-02	6,00E-02	NS
haplotype 446	399 vs 281	6,10	1,20	4,9	5,43	6,00E-06	0/100	14,58	4,10E-02	3,00E-02	S
haplotype 447	416 vs 286	14,90	7,00	7,9	2,31	7,00E-06	0/100	15,50	2,90E-02	6,00E-02	NS
haplotype 448	390 vs 263	10,60	3,80	6,8	3,01	7,00E-06	0/100	20,61	4,20E-03	1,00E-02	S
haplotype 449	281 vs 224	6,60	1,00	5,6	7,21	7,00E-06	0/100	12,48	8,50E-02	1,20E-01	NS
haplotype 450	383 vs 271	5,40	0,80	4,6	7,08	7,30E-06	0/100	15,50	3,00E-02	3,00E-02	S
haplotype 451	386 vs 281	5,00	0,70	4,3	7,93	7,70E-06	0/100	14,14	4,80E-02	2,00E-02	S
haplotype 452	396 vs 272	5,10	0,70	4,4	7,74	9,50E-06	0/100	14,65	4,00E-02	6,00E-02	NS

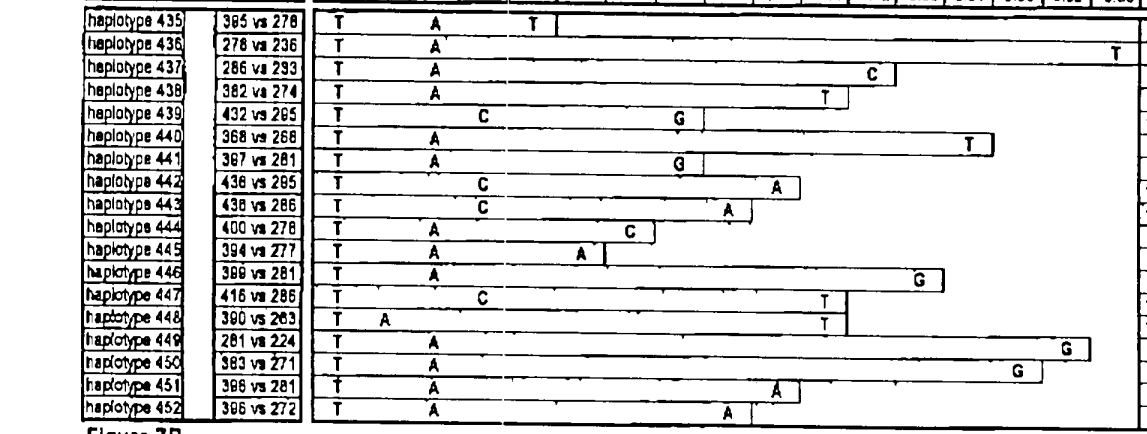


Figure 7B

HAPLOTYPE ANALYSIS SORTED BY INDIVIDUAL HAPLOTYPE TEST (2 markers)
197 FAMILY CASES vs 313 CONTROLS

MARKERS		99-1587/281	99-1572/440	5-171/204	5-2/178	99-1605/112	5-11/158	5-377/227	6-373/164	99-7190/213	99-7188/212	99-7177/81	HAPLOTYPE FREQUENCY TEST						OMNIBUS LR TEST		
POLYMORPHISM		A/G	C/T	C/T	C/T	A/G	A/G	A/G	C/T	C/T	A/G	C/T	Estimation frequency of haplotype			Statistical test			Likelihood Ratio	omnibus test	
cases / controls		136 vs 286	194 vs 304	186 vs 307	185 vs 306	190 vs 304	183 vs 303	164 vs 307	158 vs 298	157 vs 297	154 vs 292	164 vs 257									
frequency%(case/controls)		36/32 (A)	72/65 (T)	74/70 (T)	71/68 (C)	72/68 (G)	78/75 (G)	70/68 (A)	70/68 (C)	75/72 (C)	67/66 (A)	73/69 (C)									
diff freq all(case -controls)		3,3	6,4	3,9	3,6	3,4	3,3	1,4	1,9	2,9	1,8	4,7									
pvalue		3,20E-01	3,40E-02	1,80E-01	2,20E-01	2,50E-01	2,40E-01	6,60E-01	5,30E-01	3,40E-01	5,80E-01	1,40E-01									
Odds ratio		1,20	1,40	1,20	1,20	1,20	1,20	1,10	1,10	1,20	1,10	1,30									
Test Hardy Weinberg	cases vs controls	-0.03	-0.02	0.01	0.00	0.00	-0.01	0.00	0.00	-0.01	0.00	0.01									
		0.01	0.01	-0,02	-0.02	-0.01	-0.01	-0.02	-0.01	-0.00	0.00	-0.02	cases(%)	controls(%)	difference	Odds ratio	pvalue(1df)	Nb of permut	LR Test	Pvalue (3 df)	Pvalue (100 permu)	
haplotype 1	181 vs 295		T				G						60,60	47,10	13,5	1,73	5,10E-05	0/100	17,24	6,10E-04	1,00E-02	S
haplotype 2	131 vs 279	A							T				16,40	7,40	9,0	2,47	6,70E-05	1/100	11,75	8,10E-03	4,00E-02	S
haplotype 3	163 vs 254		T									C	58,50	44,40	14,1	1,76	7,00E-05	0/100	15,50	1,40E-03	1,00E-02	S
haplotype 4	184 vs 300		T	T									57,10	44,20	12,9	1,68	9,70E-05	0/100	14,30	2,40E-03	1,00E-02	S
haplotype 5	155 vs 289		T							C			57,80	45,00	12,8	1,67	2,70E-04	0/100	12,08	7,00E-03	1,00E-02	S
haplotype 6	128 vs 276	A									G		15,50	7,50	8,0	2,26	4,30E-04	0/100	11,12	1,10E-02	1,00E-02	S
haplotype 7	133 vs 283	A			T								15,20	7,50	7,7	2,20	5,90E-04	0/100	10,71	1,30E-02	1,00E-02	S
haplotype 8	134 vs 286	A						G					15,40	7,80	7,6	2,15	7,00E-04	0/100	8,28	4,00E-02	2,00E-02	S
haplotype 9	188 vs 298		T				G						54,00	43,10	10,9	1,55	8,60E-04	0/100	10,33	1,50E-02	4,00E-02	S
haplotype 10	183 vs 298		T		C								53,60	42,60	11	1,56	8,60E-04	0/100	9,93	1,90E-02	6,00E-02	NS

Figure 8A

HAPLOTYPE ANALYSIS SORTED BY INDIVIDUAL HAPLOTYPE TEST (3 markers)
197 FAMILY CASES vs 313 CONTROLS

MARKERS	99-13810/214	99-1601/402	99-13788/284	99-1587/281	99-1572/440	5-171/204	5-2/178	99-1605/112	5-11/158	5-377/227	5-373/164	99-7203/286	99-7190/213	99-7186/212	99-7177/81
POLYMORPHISM	C/T	A/T	A/G	A/G	C/T	C/T	C/T	A/G	A/G	A/G	C/T	C/T	C/T	A/G	C/T
cases / controls	152 vs 289	194 vs 305	142 vs 278	136 vs 286	194 vs 304	186 vs 307	185 vs 306	190 vs 304	183 vs 303	164 vs 307	158 vs 298	188 vs 257	157 vs 297	154 vs 292	164 vs 257
frequency%(case/controls)	40/40 (C)	67/67 (A)	57/53 (A)	36/32 (A)	72/65 (T)	74/70 (T)	71/68 (C)	72/68 (G)	78/75 (G)	70/68 (A)	70/68 (C)	73/68 (T)	75/72 (C)	67/66 (A)	73/69 (C)
diff freq all(cases-controls)	0,3	0,1	3,6	3,3	6,4	3,9	3,6	3,4	3,3	1,4	1,9	5,4	2,9	1,8	4,7
pvalue	7,50E-01	7,50E-01	3,20E-01	3,20E-01	3,40E-02	1,80E-01	2,20E-01	2,50E-01	2,40E-01	6,60E-01	5,30E-01	8,90E-02	3,40E-01	5,80E-01	1,40E-01
Odds ratio	1,00	1,00	1,20	1,20	1,40	1,20	1,20	1,20	1,20	1,10	1,10	1,30	1,20	1,10	1,30
Test Hardy Weinberg	-0,04	-0,01	-0,02	-0,03	-0,02	0,01	0,00	0,00	-0,01	0,00	0,00	0,00	-0,01	0,00	0,0
cases vs controls	0,00	0,01	0,00	0,01	0,01	-0,02	-0,02	-0,01	-0,01	-0,02	-0,01	-0,02	-0,00	0,00	-0,02

		HAPLOTYPE FREQUENCY TEST						OMNIBUS LR TEST			
		Estimation frequency of haplotype			Statistical test			Likelihood Ratio	omnibus test		
		cases(%)	controls(%)	difference	Odds ratio	pvalue(1df)	Nb of permut	LR Test	Pvalue (7 df)	Pvalue (100 permut)	
haplotype 436	125 vs 266	11,30	2,20	9,1	5,70	6,90E-08	0/100	8,52	2,80E-01	4,00E-01	NS
haplotype 437	162 vs 250	44,80	27,60	17,2	2,13	3,60E-07	0/100	21,67	2,90E-03	1,00E-02	S
haplotype 438	180 vs 291	45,80	30,90	14,9	1,89	3,70E-06	0/100	21,22	3,40E-03	1,00E-02	S
haplotype 439	128 vs 266	16,90	6,50	10,4	2,95	3,90E-06	0/100	14,80	3,70E-02	2,00E-02	S
haplotype 440	161 vs 248	56,00	39,60	16,4	1,94	4,10E-06	0/100	21,64	2,90E-03	1,00E-02	S
haplotype 441	112 vs 255	13,20	4,00	9,2	3,68	4,40E-06	3/100	17,47	1,40E-02	6,00E-02	NS
haplotype 442	166 vs 250	42,00	27,00	15	1,96	6,60E-06	0/100	14,89	3,70E-02	1,00E-02	S
haplotype 443	182 vs 296	42,80	29,00	13,9	1,84	1,10E-05	0/100	23,34	1,50E-03	1,00E-02	S
haplotype 444	161 vs 251	52,90	37,50	15,4	1,87	1,40E-05	0/100	22,40	2,10E-03	1,00E-02	S
haplotype 445	163 vs 285	43,40	28,80	14,6	1,89	1,50E-05	0/100	17,07	1,70E-02	1,00E-02	S
haplotype 446	133 vs 240	54,60	38,30	16,3	1,93	1,80E-05	0/100	15,75	2,70E-02	3,00E-02	S
haplotype 447	186 vs 295	40,60	27,40	13,2	1,82	1,80E-05	0/100	16,27	2,30E-02	1,00E-02	S
haplotype 448	114 vs 262	12,60	4,20	8,4	3,26	2,60E-05	1/100	14,42	4,30E-02	1,10E-01	NS
haplotype 449	181 vs 294	40,50	27,50	13	1,79	3,40E-05	0/100	15,25	3,20E-02	2,00E-02	S
haplotype 450	113 vs 260	12,00	4,00	8,0	3,31	3,50E-05	0/100	16,44	2,10E-02	2,00E-02	S
haplotype 451	126 vs 273	11,30	3,80	7,5	3,24	3,70E-05	0/100	18,92	8,20E-03	2,00E-02	S
haplotype 452	112 vs 257	12,30	4,10	8,2	3,25	3,90E-05	2/100	15,89	2,60E-02	2,00E-02	S
haplotype 453	179 vs 292	56,70	42,90	13,8	1,74	3,90E-05	0/100	26,02	4,80E-04	1,00E-02	S
haplotype 454	160 vs 251	50,30	35,90	14,4	1,81	4,20E-05	1/100	15,58	2,90E-02	4,00E-02	S

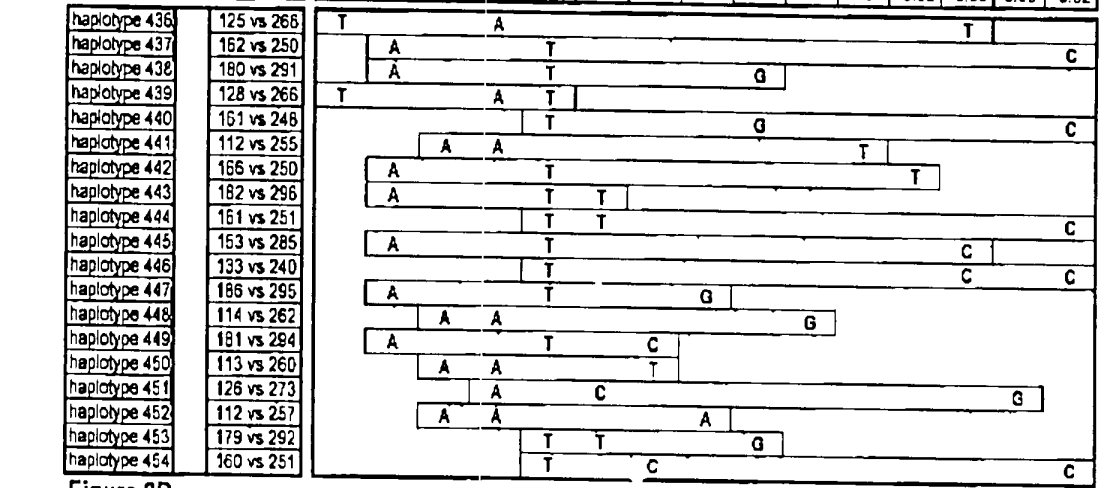


Figure 8B

HAPLOTYPE ANALYSIS SORTED BY INDIVIDUAL HAPLOTYPE TEST (2 markers)
91 FAMILY CASES having less than 65 years old vs 313 CONTROLS

MARKERS		99-13798/284	99-1587/281	99-1585/373	99-1572/440	5-171/204	5-2/178	99-1605/112	5-11/158	5-373/164	5-370/197	5-379/80	5-384/312	99-7203/298	99-7190/213	5-382/316	99-7177/81
POLYMORPHISM		A/G	A/G	C/T	C/T	C/T	C/T	A/G	A/G	C/T	A/G	A/C	C/G	C/T	C/T	C/G	C/T
cases / controls		69 vs 278	62 vs 286	89 vs 300	89 vs 304	89 vs 307	87 vs 306	86 vs 304	88 vs 303	77 vs 298	72 vs 287	67 vs 294	71 vs 211	80 vs 257	75 vs 297	76 vs 304	80 vs 257
frequency % (case/controls)		47/46 (G)	37/32 (A)	25/22 (T)	75/65 (T)	78/70 (T)	72/68 (C)	73/68 (G)	61/75 (G)	71/68 (C)	60/76 (G)	79/73 (A)	80/73 (G)	73/68 (T)	80/72 (C)	35/34 (G)	76/69 (C)
diff freq all(cases-controls)		1,2	4,4	3,8	10,1	7,2	4,7	5,1	6,0	2,8	4,2	5,1	7,1	5,7	7,1	1,3	7,2
pvalue		7,50E-01	3,40E-01	2,70E-01	1,10E-02	5,40E-02	2,20E-01	1,90E-01	1,00E-01	4,80E-01	2,70E-01	2,10E-01	8,90E-02	1,70E-01	7,40E-02	7,50E-01	7,80E-02
Odds ratio		1,10	1,20	1,20	1,60	1,50	1,20	1,30	1,40	1,10	1,30	1,30	1,50	1,30	1,50	1,10	1,40
Test Hardy Weinberg	cases vs controls	-0.01	0.01	0.02	-0.01	0.01	-0.00	0.00	-0.01	-0.00	-0.01	-0.01	-0.01	-0.01	-0.03	0.01	0.01
		0.00	0.01	-0.01	0.01	-0.02	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01	-0.02	-0.00	-0.02	-0.02

HAPLOTYPE FREQUENCY TEST						OMNIBUS LR TEST		
Estimation frequency of haplotype			Statistical test			Likelihood Ratio		omnibus test
cases(%)	controls(%)	difference	Odds ratio	pvalue(1df)	Nb of permut	LR Test	Pvalue (3 df)	Pvalue (100 permut)	
haplotype 1	88 vs 300	64,40	44,20	20,2	2,28	2,50E-06	0/100	21,42	8,30E-05	1,00E-02	S
haplotype 2	85 vs 295	67,30	47,10	20,2	2,32	3,00E-06	0/100	21,69	7,50E-05	1,00E-02	S
haplotype 3	74 vs 289	65,90	45,00	20,9	2,37	5,40E-06	0/100	19,59	2,10E-04	1,00E-02	S
haplotype 4	79 vs 254	65,00	44,40	20,6	2,33	6,00E-06	0/100	19,83	1,70E-04	1,00E-02	S
haplotype 5	86 vs 298	59,00	42,60	16,4	1,84	1,40E-04	0/100	14,14	2,60E-03	1,00E-02	S
haplotype 6	66 vs 287	64,10	45,80	18,3	2,11	1,50E-04	0/100	14,29	2,50E-03	1,00E-02	S
haplotype 7	85 vs 298	59,20	43,10	16,1	1,92	1,90E-04	0/100	13,49	3,70E-03	2,00E-02	S
haplotype 8	79 vs 254	60,50	43,60	16,9	1,97	2,10E-04	0/100	12,97	4,80E-03	1,00E-02	S
haplotype 9	70 vs 207	64,70	46,70	18	2,10	2,10E-04	0/100	13,46	3,70E-03	1,00E-02	S
haplotype 10	69 vs 270	18,60	8,10	10,5	2,58	2,80E-04	0/100	9,80	2,00E-02	7,00E-02	NS
haplotype 11	61 vs 286	18,80	8,10	10,7	2,62	8,50E-08	2/100	8,66	3,40E-02	3,00E-02	S
haplotype 12	60 vs 279	17,70	7,40	10,3	2,70	1,30E-07	3/100	8,28	4,00E-02	3,00E-02	S
haplotype 13	71 vs 279	64,40	47,70	16,7	1,98	1,50E-07	1/100	12,81	4,60E-03	1,00E-02	S

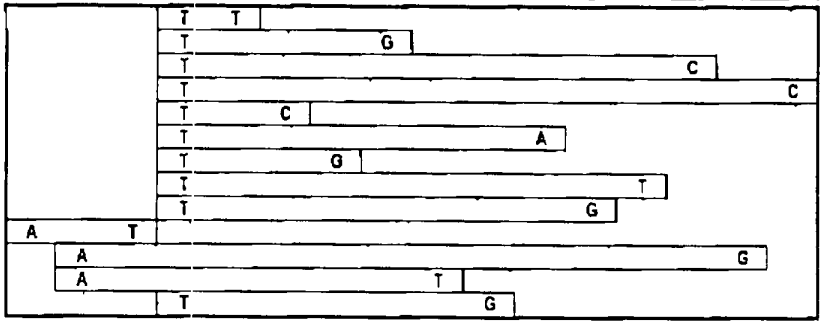


Figure 9A

HAPLOTYPE ANALYSIS SORTED BY INDIVIDUAL HAPLOTYPE TEST (3 markers)

91 FAMILY CASES having less than 65 years old vs 313 CONTROLS

MARKERS		99-1601/402	99-1572/440	5-171/204	5 2/178	99-1605/112	5-11/158	5-376/200	5-373/164	5-379/80	5-384/312	99-7203/286	99-7190/213	99-7186/212	99-7177/81
POLYMORPHISM		A/T	C/T	C/T	C/T	A/G	A/G	A/G	C/T	A/C	C/G	C/T	C/T	A/G	C/T
cases / controls		89 vs 305	89 vs 304	89 vs 307	87 vs 306	86 vs 304	86 vs 303	81 vs 307	77 vs 298	67 vs 294	71 vs 211	80 vs 257	75 vs 297	72 vs 292	80 vs 257
frequency % (case/controls)		69/67 (A)	75/65 (T)	78/70 (T)	72/68 (C)	73/68 (G)	81/75 (G)	70/68 (G)	71/68 (C)	79/73 (A)	80/73 (G)	73/68 (T)	80/72 (C)	35/33 (G)	76/69 (C)
diff freq all(cases-controls)		2,4	10,1	7,2	4,7	5,1	6,0	1,6	2,8	5,1	7,1	6,7	7,1	1,5	7,2
pvalue		5,30E-01	1,10E-02	5,40E-02	2,20E-01	1,90E-01	1,00E-01	6,60E-01	4,80E-01	2,10E-01	8,90E-02	1,70E-01	7,40E-02	6,60E-01	7,80E-02
Odds ratio		1,10	1,60	1,50	1,20	1,30	1,40	1,10	1,10	1,30	1,50	1,30	1,50	1,10	1,40
Test Hardy Weinberg	cases vs	-0.01	-0.01	0.01	-0.00	0.00	-0.01	-0.00	-0.00	-0.01	-0.01	-0.01	-0.03	0.01	0.01
	controls	0.01	0.01	-0,02	-0.02	-0.01	-0.01	-0.02	-0.01	-0.01	-0.01	-0.02	-0.00	0.00	-0.02

Haplotype	cases vs controls	99-1601/402	99-1572/440	5-171/204	5 2/178	99-1605/112	5-11/158	5-376/200	5-373/164	5-379/80	5-384/312	99-7203/286	99-7190/213	99-7186/212	99-7177/81	HAPLOTYPE FREQUENCY TEST: Estimation frequency of haplotype: cases(%)	controls(%)	differency	Statistical test: Odds ratio	pvalue(1df)	Nb of permut	OMNIBUS LR TEST: Likelihood Ratio: LR Test	Pvalue (7 df)	omnibus test: Pvalue (100 permut)	
haplotype 421	73 vs 285	A	T										C			52,30	28,80	23,5	2,70	2,30E-07	0/100	24,62	8,60E-04	1,00E-02	S
haplotype 422	79 vs 250	A	T												C	50,20	27,60	22,6	2,65	2,40E-07	0/100	23,60	1,30E-03	1,00E-02	S
haplotype 423	77 vs 248		T				G								C	63,70	39,60	24,1	2,68	3,10E-07	0/100	26,22	4,50E-04	1,00E-02	S
haplotype 424	85 vs 291	A	T				G									52,50	30,90	21,6	2,47	4,00E-07	0/100	26,12	4,60E-04	1,00E-02	S
haplotype 425	87 vs 296	A	T	T												50,00	29,00	21	2,46	5,70E-07	0/100	28,38	1,90E-04	1,00E-02	S
haplotype 426	79 vs 251		T	T											C	60,60	37,50	23,1	2,57	7,80E-07	0/100	25,59	5,90E-04	1,00E-02	S
haplotype 427	66 vs 240		T										C		C	63,00	38,30	24,7	2,74	2,50E-06	0/100	22,70	1,90E-03	1,00E-02	S
haplotype 428	85 vs 292		T	T			G									64,70	42,90	21,8	2,44	3,00E-06	0/100	28,47	1,80E-04	1,00E-02	S
haplotype 429	65 vs 283	A	T							A						53,00	30,20	22,8	2,61	3,00E-06	0/100	21,83	2,60E-03	1,00E-02	S
haplotype 430	85 vs 294	A	T		C											46,60	27,50	19,1	2,30	3,50E-06	0/100	18,17	1,10E-02	1,00E-02	S
haplotype 431	74 vs 287		T	T									C			62,70	41,20	21,5	2,39	4,40E-06	0/100	23,79	1,20E-03	1,00E-02	S
haplotype 432	69 vs 203	A	T								G					52,80	30,60	22	2,53	4,60E-06	0/100	21,47	3,10E-03	1,00E-02	S
haplotype 433	58 vs 242		T							A					C	62,70	39,00	23,7	2,63	5,40E-06	0/100	21,89	2,80E-03	1,00E-02	S
haplotype 434	77 vs 251		T		C										C	56,70	35,90	20,8	2,34	7,30E-06	0/100	21,10	3,50E-03	1,00E-02	S
haplotype 435	79 vs 250	A	T									T				46,40	27,00	19,4	2,34	7,70E-06	0/100	17,26	1,60E-02	3,00E-02	S
haplotype 436	84 vs 295	A	T			G										45,80	27,40	18,4	2,24	8,60E-06	0/100	17,37	1,50E-02	2,00E-02	S
haplotype 437	79 vs 249		T									T			C	56,90	36,80	20,1	2,27	1,20E-05	0/100	20,59	4,40E-03	2,00E-02	S
haplotype 438	75 vs 250		T			G									C	56,90	36,40	20,5	2,30	1,20E-05	0/100	20,14	5,20E-03	1,00E-02	S
haplotype 439	72 vs 281		T				G						C			65,70	44,80	20,8	2,35	2,50E-05	0/100	20,56	4,40E-03	1,00E-02	S
haplotype 440	75 vs 286	A	T						C							46,10	27,50	18,6	2,26	3,20E-05	0/100	15,56	2,90E-02	3,00E-02	S
haplotype 441	68 vs 278		T										C	G		16,60	5,50	11,1	3,42	1.20E-05	0/100	26,27	4,50E-04	1,00E-02	S
haplotype 442	81 vs 162		T								G				C	61,80	39,50	22,4	2,48	2.50E-05	0/100	18,99	8,20E-03	1,00E-02	S
haplotype 443	79 vs 295	A	T					G								44,80	27,60	17,2	2,13	3.20E-05	0/100	15,10	3,50E-02	3,00E-02	S

Figure 9B

HAPLOTYPE ANALYSIS SORTED BY INDIVIDUAL HAPLOTYPE TEST (2 markers)
294 SPORADICS CASES vs 313 CONTROLS

MARKERS		99-1601/402	99-13798/284	5-171/204	5-11/158	5-14/165	5-377/227	5-376/266	5-373/164	6-370/197	5-382/316	99-7182/49
POLYMORPHISM		A/T	A/G	C/T	A/G	C/T	A/G	A/G	C/T	A/G	C/G	C/T
cases / controls		286 vs 305	281 vs 278	287 vs 307	287 vs 303	290 vs 307	285 vs 307	290 vs 298	275 vs 298	276 vs 287	289 vs 304	267 vs 287
frequency % (case/controls)		40/32 (T)	59/53 (A)	73/70 (T)	76/75 (G)	41/34 (C)	35/31 (G)	35/31 (A)	36/31 (T)	76/76 (G)	42/34 (G)	42/36 (T)
Iff freq. all. (cases - controls		7,4	6,5	2,5	1,1	6,9	4,5	4,5	5,5	0,3	8,0	5,7
pvalue		7,70E-03	2,70E-02	3,20E-01	5,60E-01	1,40E-02	9,40E-02	1,00E-01	4,50E-02	7,50E-01	4,40E-03	4,80E-02
Odds ratio		1,40	1,30	1,10	1,10	1,30	1,20	1,20	1,30	1,00	1,40	1,30
Test Hardy Weinberg	cases vs controls	0.01	0.01	0.00	-0.01	0.00	0.00	0.00	-0.00	-0.01	0.01	0.02
		0.01	0.00	-0.02	-0.01	-0.01	-0.02	-0.02	-0.01	-0.01	-0.02	0.01

haplotype 1	283 vs 298	T										G	19,90	10,60	9,3	2,09	1,00E-05	0/100	17,90	4,40E-04	1,00E-02	S
haplotype 2	284 vs 301			T								G	21,20	11,70	9,5	2,03	1,10E-05	0/100	18,75	3,00E-04	1,00E-02	S
haplotype 3	284 vs 301	T				C							19,90	10,80	9,1	2,06	1,40E-05	0/100	16,37	9,40E-04	1,00E-02	S
haplotype 4	279 vs 270		A					A					22,20	12,50	9,7	2,00	2,10E-05	0/100	15,16	1,70E-03	1,00E-02	S
haplotype 5	265 vs 269		A						T				22,80	12,90	9,9	2,00	2,10E-05	0/100	15,96	1,10E-03	1,00E-02	S
haplotype 6	284 vs 286				G							G	19,30	10,60	8,7	2,02	2,90E-05	0/100	18,43	3,50E-04	1,00E-02	S
haplotype 7	274 vs 287									G	G		19,10	10,30	8,8	2,05	3,00E-05	0/100	18,61	3,20E-04	1,00E-02	S
haplotype 8	258 vs 264		A									T	25,70	15,40	10,3	1,90	3,70E-05	0/100	14,62	2,10E-03	1,00E-02	S
haplotype 9	279 vs 301	T					G						17,40	9,30	8,1	2,05	4,60E-05	0/100	13,96	2,90E-03	1,00E-02	S
haplotype 10	279 vs 278		A									G	25,30	15,50	9,8	1,84	1,40E-08	0/100	15,53	1,40E-03	1,00E-02	S
haplotype 11	269 vs 292	T							T				17,90	9,70	8,2	2,03	1,50E-07	0/100	13,86	3,00E-03	1,00E-02	S
haplotype 12	285 vs 303			T		C							20,20	11,70	8,5	1,91	1,80E-07	0/100	15,74	1,20E-03	1,00E-02	S

HAPLOTYPE FREQUENCY TEST						OMNIBUS LR TEST		
Estimation frequency of haplotype			Statistical test			Likelihood Ratio		omnibus test
cases(%)	controls(%)	difference	Odds ratio	pvalue(1df)	Nb of permut	LR Test	Pvalue (3 df)	Pvalue (100 permut)

Figure 10A

HAPLOTYPE ANALYSIS SORTED BY INDIVIDUAL HAPLOTYPE TEST (3 markers)
294 SPORADICS CASES vs 313 CONTROLS

MARKERS		99-1601/402	99-13798/284	99-1587/281	5-169/97	5-2/178	5-377/227	5-376/266	5-375/200	5-373/164	99-7182/49
POLYMORPHISM		A/T	A/G	A/G	C/G	C/T	A/G	A/G	A/G	C/T	C/T
cases / controls		286 vs 305	281 vs 278	274 vs 286	285 vs 305	285 vs 306	285 vs 307	290 vs 298	290 vs 307	275 vs 298	267 vs 287
frequency % (case/controls)		40/32 (T)	59/53 (A)	67/67 (G)	82/82 (C)	35/31 (T)	35/31 (G)	35/31 (A)	35/31 (A)	36/31 (T)	42/36 (T)
diff freq all(cases-controls)		7,4	8,5	0,2	0,3	3,9	4,5	4,5	4,4	5,5	5,7
pvalue		7,70E-03	2,70E-02	7,50E-01	7,50E-01	1,50E-01	9,40E-02	1,00E-01	1,00E-01	4,50E-02	4,80E-02
Odds ratio		1,40	1,30	1,00	1,00	1,20	1,20	1,20	1,20	1,30	1,30
Test Hardy Weinberg	cases vs controls	0.01	0.01	-0.02	-0.01	-0.00	0.00	0.00	0.00	-0.00	0.02
		0.01.	0.00	0.01	-0.01	-0.02	-0.02	-0.02	-0.02	-0.01	0.01

HAPLOTYPE FREQUENCY TEST						OMNIBUS LR TEST			
Estimation frequency of haplotype			Statistical test			Likelihood Ratio		omnibus test	
cases(%)	controls(%)	difference	Odds ratio	pvalue(1df)	Nb of permut	LR Test	Pvalue (7 df)	Pvalue (100 permut)	
5,60	0,00	5,6	100,00	5,40E-07	0/100	21,17	3,50E-03	1,00E-02	S
12,70	3,80	8,9	3,69	5,70E-07	0/100	27,02	3,20E-04	1,00E-02	S
16,50	6,60	9,9	2,77	5,70E-07	0/100	21,42	3,10E-03	1,00E-02	S
6,20	0,60	5,6	10,69	6,70E-07	0/100	20,00	5,60E-03	1,00E-02	S
6,70	0,80	5,9	9,24	7,10E-07	0/100	16,86	1,80E-02	1,00E-02	S
16,10	6,60	9,5	2,69	7,10E-07	0/100	20,18	5,20E-03	1,00E-02	S
12,20	3,90	8,3	3,45	8,70E-07	0/100	25,78	5,50E-04	1,00E-02	S
12,40	4,10	8,3	3,34	9,10E-07	0/100	24,21	1,00E-03	1,00E-02	S
12,40	4,10	8,3	3,34	9,10E-07	0/100	23,89	1,20E-03	1,00E-02	S

		99-1601/402	99-13798/284	99-1587/281	5-169/97	5-2/178	5-377/227	5-376/266	5-375/200	5-373/164	99-7182/49
haplotype 436	284 vs 278	T		A		T					
haplotype 437	259 vs 263	T	A							T	
haplotype 438	272 vs 295	T			C		G				
haplotype 439	253 vs 274	T		A						T	
haplotype 440	246 vs 268	T		A							T
haplotype 441	277 vs 295	T			C				A		
haplotype 442	273 vs 264	T	A					A			
haplotype 443	271 vs 272	T	A				G				
haplotype 444	273 vs 272	T	A						A		

Figure 10 B

HAPLOTYPE ANALYSIS SORTED BY INDIVIDUAL HAPLOTYPE TEST (2 markers)

70 SPORADICS CASES (Informatifs) vs 313 CONTROLS

MARKERS		99-1601/402	99-1572/440	5-171/204	5-11/158	5-370/197	5-382/316	5-381/133	99-7182/49
POLYMORPHISM		A/T	C/T	C/T	A/G	A/G	C/G	A/G	C/T
cases / controls		70 vs 305	68 vs 304	69 vs 307	69 vs 303	62 vs 287	70 vs 304	69 vs 304	67 vs 287
frequency % (case/controls)		44/32 (T)	70/65 (T)	30/29 (C)	28/24 (A)	29/23 (A)	64/34 (G)	55/34 (A)	56/35 (T)
diff freq all(cases-controls)		11,5	4,8	1,3	4,4	5,3	20,1	21,3	20,3
pvalue		9,60E-03	2,70E-01	7,50E-01	2,70E-01	2,10E-01	1,00E-05	3,50E-06	1,50E-05
Odds ratio		1,60	1,20	1,10	1,20	1,30	2,30	2,40	2,30
Test Hardy Weinberg	cases vs controls	0.00	-0.03	0.02	-0.03	-0.04	0.02	0.02	0.02
		0.01	0.01	-0,02	-0.01	-0.01	-0.02	0.01	0.01

HAPLOTYPE FREQUENCY TEST						OMNIBUS LR TEST			
Estimation frequency of haplotype			Statistical test			Likelihood Ratio		omnibus test	
cases(%)	controls(%)	difference	Odds ratio	pvalue(1df)	Nb of permut	LR Test	Pvalue (3 df)	Pvalue (100 permut)	
haplotype 1	62 vs 287	G A	28,60	10,50	18,1	3,43	9,40E-08	0/100	31,46	6,70E-07	1,00E-02	S
haplotype 2	69 vs 298	T A	27,00	10,70	16,3	3,09	5,20E-07	0/100	28,27	3,10E-06	1,00E-02	S
haplotype 3	68 vs 301	T A	29,20	12,20	17	2,96	7,10E-07	0/100	25,93	9,50E-06	1,00E-02	S
haplotype 4	69 vs 301	T G	28,20	11,70	16,5	2,96	8,70E-07	0/100	24,47	2,00E-05	1,00E-02	S
haplotype 5	68 vs 296	G A	26,80	10,90	15,9	2,99	1,30E-06	0/100	26,23	8,30E-06	1,00E-02	S
haplotype 6	67 vs 296	T A	44,90	24,30	20,6	2,53	1,70E-06	0/100	23,37	3,30E-05	1,00E-02	S
haplotype 7	62 vs 287	G G	26,20	10,30	15,9	3,09	2,00E-06	0/100	25,70	1,10E-05	1,00E-02	S
haplotype 8	67 vs 287	G T	54,50	32,50	22	2,48	2,00E-06	0/100	21,97	6,50E-05	1,00E-02	S
haplotype 9	70 vs 298	T G	25,80	10,60	15,2	2,94	2,00E-06	0/100	25,83	1,00E-05	1,00E-02	S
haplotype 10	69 vs 296	G G	25,70	10,60	15,1	2,92	2,70E-06	0/100	24,24	2,20E-05	1,00E-02	S
haplotype 11	66 vs 287	A T	56,10	34,10	22	2,46	2,70E-06	0/100	25,32	1,30E-05	1,00E-02	S

Figure 11A

HAPLOTYPE ANALYSIS SORTED BY INDIVIDUAL HAPLOTYPE TEST (3 markers)
70 SPORADICS CASES (Informatifs) vs 313 CONTROLS

MARKERS		99-1601/402	99-1585/373	99-1572/440	5-169/97	5-2/178	99-1605/112	5-11/158	5-14/165	5-377/227	5-378/288	5-376/200	5-370/197	5-382/316	5-381/133	99-7182/49
POLYMORPHISM		A/T	C/T	C/T	C/G	C/T	A/G	A/G	C/T	A/G	A/G	A/G	A/G	C/G	A/G	C/T
cases / controls		70 vs 305	67 vs 300	68 vs 304	68 vs 305	69 vs 306	70 vs 304	69 vs 303	70 vs 307	70 vs 307	69 vs 298	69 vs 307	62 vs 287	70 vs 304	69 vs 304	67 vs 287
frequency%(case/controls)		44/32 (T)	79/78 (C)	70/65 (T)	83/82 (C)	43/31 (T)	43/31 (A)	28/24 (A)	54/34 (C)	43/31 (G)	42/31 (A)	42/31 (A)	29/23 (A)	64/34 (G)	55/34 (A)	56/36 (T)
Iff freq all[cases-controls]		11,5	1,9	4,8	1,5	11,8	12,3	4,4	19,4	12,3	11,7	11,5	5,3	20,1	21,3	20,3
pvalue		9,60E-03	5,80E-01	2,70E-01	6,60E-01	8,10E-03	5,20E-03	2,70E-01	2,00E-05	5,20E-03	8,10E-03	9,60E-03	2,10E-01	1,00E-05	3,50E-06	1,50E-05
Odds ratio		1,80	1,10	1,20	1,10	1,70	1,70	1,20	2,20	1,70	1,70	1,60	1,30	2,30	2,40	2,30
Test Hardy	cases vs controls	0,00	0,03	-0,03	-0,01	-0,02	-0,00	-0,03	0,01	-0,00	-0,01	-0,01	-0,04	0,02	0,02	0,02
		0,01	-0,01	0,01	-0,01	-0,02	-0,01	-0,01	-0,01	-0,02	-0,02	-0,02	-0,01	-0,02	0,01	0,01
haplotype 415	59 vs 278		C										G		A	
haplotype 416	67 vs 292	T			C										A	
haplotype 417	62 vs 287												G	G	A	
haplotype 418	68 vs 292	T			C									G		
haplotype 419	68 vs 295	T			C					G						
haplotype 420	67 vs 294	T			C	T										
haplotype 421	62 vs 279							G					G		A	
haplotype 422	65 vs 286		C					G							A	
haplotype 423	68 vs 295	T			C				C							
haplotype 424	59 vs 278		C										G	G		
haplotype 425	86 vs 286		C					G						G		
haplotype 426	67 vs 285	T			C							A				
haplotype 427	67 vs 286	T			C						A					
haplotype 428	60 vs 281				C								G		A	
haplotype 429	68 vs 295	T			C		A									
haplotype 430	65 vs 276	T		T												T

HAPLOTYPE FREQUENCY TEST						OMNIBUS LR TEST		
Estimation frequency of haplotype			Statistical test			Likelihood Ratio		omnibus test
cases(%)	controls(%)	difference	Odds ratio	pvalue(1df)	Nb of permut	LR Test	Pvalue (7 df)	Pvalue (100 permut)
26,70	7,90	18,8	4,26	3,80E-09	0/100	37,72	3,30E-06	1,00E-02 S
26,60	9,00	17,6	3,65	2,30E-08	0/100	32,32	3,40E-05	1,00E-02 S
26,20	8,50	17,7	3,80	2,70E-08	0/100	35,90	7,60E-06	1,00E-02 S
25,60	8,70	16,9	3,62	3,90E-08	0/100	30,37	8,00E-05	1,00E-02 S
21,70	6,80	15,1	3,90	5,90E-08	0/100	25,41	6,20E-04	1,00E-02 S
21,30	6,50	14,8	3,90	8,90E-08	0/100	23,93	1,10E-03	1,00E-02 S
28,60	10,40	18,2	3,45	9,40E-08	0/100	32,79	2,90E-05	1,00E-02 S
24,60	8,20	16,4	3,63	9,90E-08	0/100	31,60	4,80E-05	1,00E-02 S
25,20	8,80	16,4	3,46	1,00E-07	0/100	28,22	1,90E-04	1,00E-02 S
24,70	8,00	16,7	3,77	1,30E-07	0/100	31,52	4,80E-05	1,00E-02 S
24,20	8,20	16	3,60	1,30E-07	0/100	29,84	9,90E-05	1,00E-02 S
21,30	6,60	14,7	3,81	1,30E-07	0/100	23,71	1,20E-03	1,00E-02 S
21,30	6,60	14,7	3,84	1,30E-07	0/100	24,64	8,60E-04	1,00E-02 S
26,00	8,90	17,1	3,60	1,50E-07	0/100	38,59	2,30E-06	1,00E-02 S
21,70	7,00	14,7	3,71	1,60E-07	0/100	24,78	8,20E-04	1,00E-02 S
23,00	7,40	15,6	3,73	1,60E-07	0/100	28,56	1,70E-04	1,00E-02 S

Figure 11B

MARKERS		99-1572/440	5-171/204
HAPLOTYPE 1		T	T
pvalue (1df)	Familial cases vs controls (2 screening)	1,10E-02	5,40E-02
% frequency differency (sample sizes)		10.1 (89 vs 304)	7.2 (89 vs 307)

		HAPLOTYPE FREQUENCY TEST							OMNIBUS LR TEST			
		stimation frequency of haplotyp				Statistical test			Likelihood Ratio		omnibus test	
		sample sizes cases vs controls	cases(%)	controls(%)	differency (%)	Odds ratio	pvalue(1df)	Pvalue (1000 permut)	Likelihood Ratio Test	Pvalue (3 df)	Pvalue (1000 permut)	
HAPLOTYPE 1	cases vs controls	464 vs 300	50,1	44,2	5,9	1.26	2,50E-02	2,E-02	4,81	1,80E-01	1,80E-01	NS
	cases (<=65 years) vs controls	177 vs 300	54,5	44,2	10,3	1.51	2,10E-03	3,E-03	8,62	3,40E-02	4,60E-02	S
	cases (>65 years) vs controls	283 vs 300	46,7	44,2	2,5	1.11	3,70E-01	2,E-01	1,11	7,50E-01	7,60E-01	NS
	sporadic cases vs controls	280 vs 300	45,5	44,2	1,3	1.05	6,50E-01	5,E-01	1,32	7,10E-01	7,40E-01	NS
	sporadic cases (<=65 years) vs controls	89 vs 300	45,4	44,2	1,2	1.05	7,50E-01	7,E-01	1,19	7,50E-01	7,30E-01	NS
	sporadic cases (>65 years) vs controls	187 vs 300	45,0	44,2	0,8	1.03	7,50E-01	7,E-01	0,85	8,30E-01	8,40E-01	NS
	sporadic informatif vs controls	67 vs 300	43,4	44,2	0,8	0.97	7,50E-01	8,E-01	3,29	3,50E-01	3,30E-01	NS
	familial cases vs controls	184 vs 300	57,1	44,2	12,9	1.68	9,70E-05	<1.0e-03	14,30	2,40E-03	4,00E-03	S
	familial cases (<=65 years) vs controls	88 vs 300	64,4	44,2	20,2	2.28	2,50E-06	<1.0e-03	21,42	8,30E-05	1,00E-03	S
	familial cases (>65 years) vs controls	96 vs 300	50,1	44,2	5,9	1.26	1,50E-01	9,E-02	2,04	5,50E-01	5,50E-01	NS
	familial cases (>=3caP) vs controls	83 vs 300	58,6	44,2	14,4	1.79	9,60E-04	1,E-03	10,98	1,20E-02	1,00E-02	S

Figure 12A

MARKERS		5-370/197	5-381/133
HAPLOTYPE 1		G	A
pvalue (1df)	Sporadic cases vs controls (2 screening)	2,10E-01	3,50E-06
% frequency difference (sample sizes)		6.3 (52 vs 287)	21.3 (69 vs 304)

		HAPLOTYPE FREQUENCY TEST										OMNIBUS LR TEST			
		Estimation frequency of haplotype				Statistical test						Likelihood Ratio		omnibus test	
		sample sizes cases vs controls	frequency cases (%)	frequency controls (%)	frequency difference (%)	Odds ratio	p-excess	Chi-S	pvalue(1df)	Pvalue (1000 permutat)	Nb of permut	LR Test	Pvalue (3 df)	Pvalue (1000 permutations)	
HAPLOTYPE 1	cases vs controls	422 vs 287	14,5	10,5	4	1.45	4.52	4.98	2,50E-02	2,E-02	18/1000	5,54	1,30E-01	1,70E-01	NS
	cases (<=65 years) vs controls	159 vs 287	15,2	10,5	4,7	1.53	6.22	4.20	4,00E-02	3,E-02	34/1000	4,68	2,00E-01	2,70E-01	NS
	cases (>65 years) vs controls	260 vs 287	13,9	10,5	3,4	1.38	3.84	3.03	7,80E-02	6,E-02	64/1000	3,78	2,80E-01	4,10E-01	NS
	sporadic cases vs controls	276 vs 287	17,0	10,5	6,5	1.75	7.25	10 08	1,50E-03	2,E-03	2/1000	11,53	8,90E-03	8,00E-03	S
	sporadic cases (<=65 years) vs controls	87 vs 287	17,4	10,5	6,9	1.80	7.71	5.99	1,40E-02	2,E-02	16/1000	6,28	9,80E-02	1,20E-01	NS
	sporadic cases (>65 years) vs controls	186 vs 287	16,5	10,5	6	1.69	6.74	7.35	6,50E-03	6,E-03	6/1000	8,49	3,70E-02	4,50E-02	S
	sporadic informatif vs controls	82 vs 287	28,6	10,5	18,1	3.43	20.30	28.48	9,40E-08	<1.0e-03	0/1000	31,46	6,70E-07	1,00E-03	S
	familial cases vs controls	146 vs 287	9,9	10,5	0,6	0.94	-0.61	0.06	7,50E-01	8,E-01	776/1000	1,13	7,50E-01	9,20E-01	NS
	familial cases (<=65 years) vs controls	72 vs 287	12,5	10,5	2	1.22	2.26	0.49	4,80E-01	5,E-01	488/1000	1,83	6,90E-01	6,10E-01	NS
	familial cases (>65 years) vs controls	74 vs 287	7,4	10,5	3,1	0.69	-3.40	1.23	2,50E-01	3,E-01	286/1000	1,80	5,90E-01	6,70E-01	NS
	familial cases (>=3caP) vs controls	61 vs 287	7,4	10,5	3,1	0.68	-3.46	1.08	2,90E-01	3,E-01	322/1000	2,85	4,10E-01	4,20E-01	NS

Figure 12 B

MARKERS		99-1601/402	5-382/316
HAPLOTYPE 1		T	G
pvalue (1df)	Sporadic cases vs controls (2 screening)	7,70E-03	4,40E-03
% frequency difference (sample sizes)		7.4 (286 vs 305)	7.4 (286 vs 305)

		HAPLOTYPE FREQUENCY TEST										OMNIBUS LR TEST			
		Estimation frequency of haplotype				Statistical test						Likelihood Ratio		omnibus test	
		sample sizes cases vs controls	frequency cases (%)	frequency controls (%)	frequency difference (%)	Odds ratio	p-excess	Chi-S	pvalue(1df)	Pvalue (1000 permutations)	Nb of permutations	Likelihood Ratio Test	Pvalue (3 df)	Pvalue (1000 permutations)	
HAPLOTYPE 1	cases vs controls	449 vs 298	17,2	10,6	6,6	1,75	7,35	12,37	4,30E-04	<1.0e-03	0/1000	9,81	1,90E-02	9,00E-03	S
	cases (<=65 years) vs controls	165 vs 298	17,6	10,8	7	1,80	7,85	9,18	2,40E-03	8,E-03	8/1000	6,54	8,20E-02	7,80E-02	NS
	cases (>65 years) vs controls	271 vs 298	16,7	10,8	6,1	1,69	6,81	9,00	2,60E-03	7,E-03	7/1000	8,28	4,00E-02	4,90E-02	S
	sporadic cases vs controls	283 vs 298	19,8	10,8	9,3	2,09	10,37	19,44	1,00E-05	<1.0e-03	0/1000	17,90	4,40E-04	1,00E-03	S
	sporadic cases (<=65 years) vs controls	90 vs 298	22,8	10,8	12	2,46	13,40	17,10	3,40E-05	<1.0e-03	0/1000	11,47	9,30E-03	4,00E-03	S
	sporadic cases (>65 years) vs controls	189 vs 298	18,5	10,8	7,9	1,91	8,77	12,07	5,00E-04	2,E-03	2/1000	13,61	3,30E-03	4,00E-03	S
	sporadic informatif vs controls	70 vs 298	25,8	10,8	15,2	2,94	17,03	22,60	2,00E-06	<1.0e-03	0/1000	25,83	1,00E-05	1,00E-03	S
	familial cases vs controls	157 vs 298	11,9	10,8	1,3	1,14	1,46	0,38	5,30E-01	6,E-01	568/1000	1,46	6,80E-01	6,70E-01	NS
	familial cases (<=65 years) vs controls	75 vs 298	11,6	10,8	1	1,11	1,11	0,12	6,50E-01	7,E-01	740/1000	2,30	5,10E-01	4,80E-01	NS
	familial cases (>65 years) vs controls	82 vs 298	12,4	10,8	1,8	1,19	1,96	0,41	4,80E-01	6,E-01	559/1000	1,72	6,10E-01	6,20E-01	NS
	familial cases (>=3caP) vs controls	64 vs 298	7,9	10,8	2,7	0,72	-3,03	0,85	3,40E-01	4,E-01	394/1000	2,58	4,80E-01	4,30E-01	NS

Figure 12 C

Figure 13A

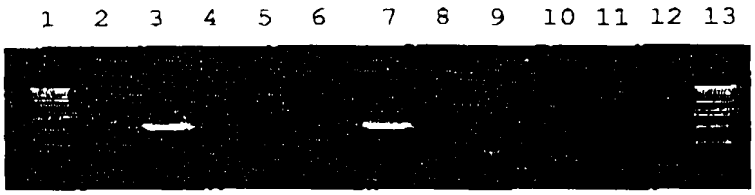


Figure 13B

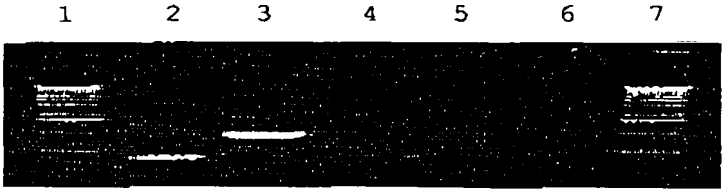


Figure 13C

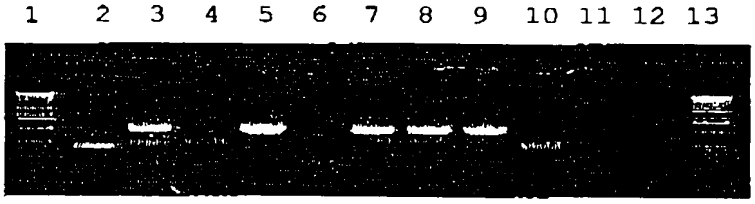


Figure 13D

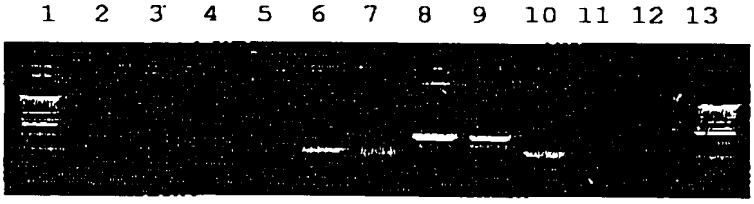
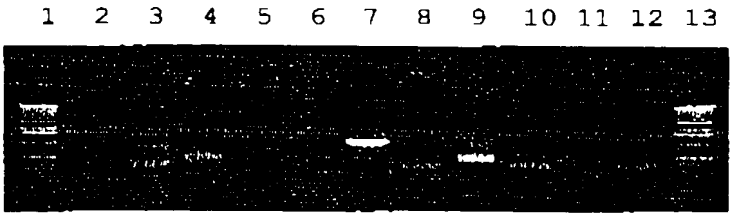


Figure 13E



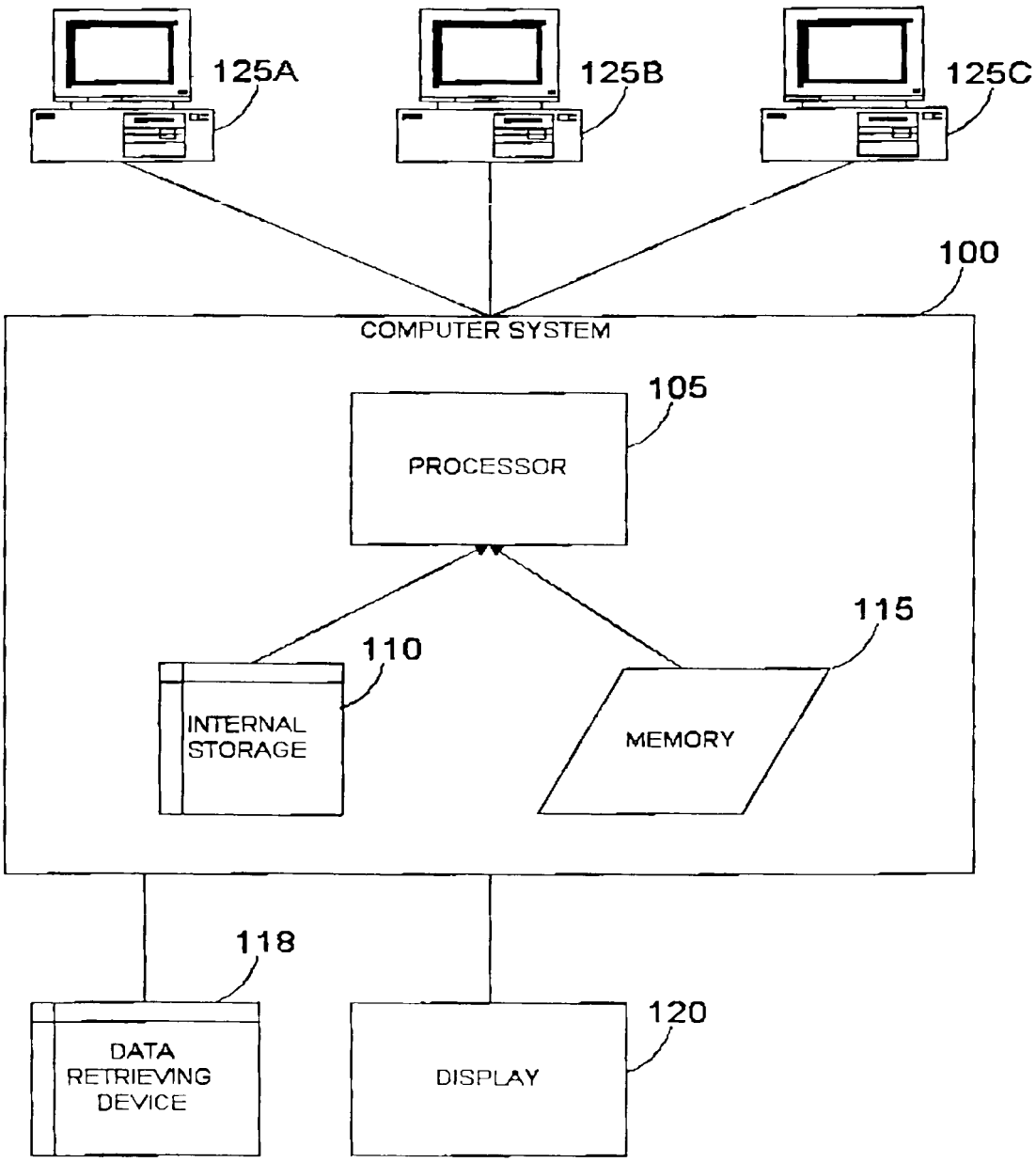

125A
125B
125C
100
COMPUTER SYSTEM
105
PROCESSOR
115
110
INTERNAL STORAGE
MEMORY
118
DATA RETRIEVING DEVICE
120
DISPLAY

FIGURE 14

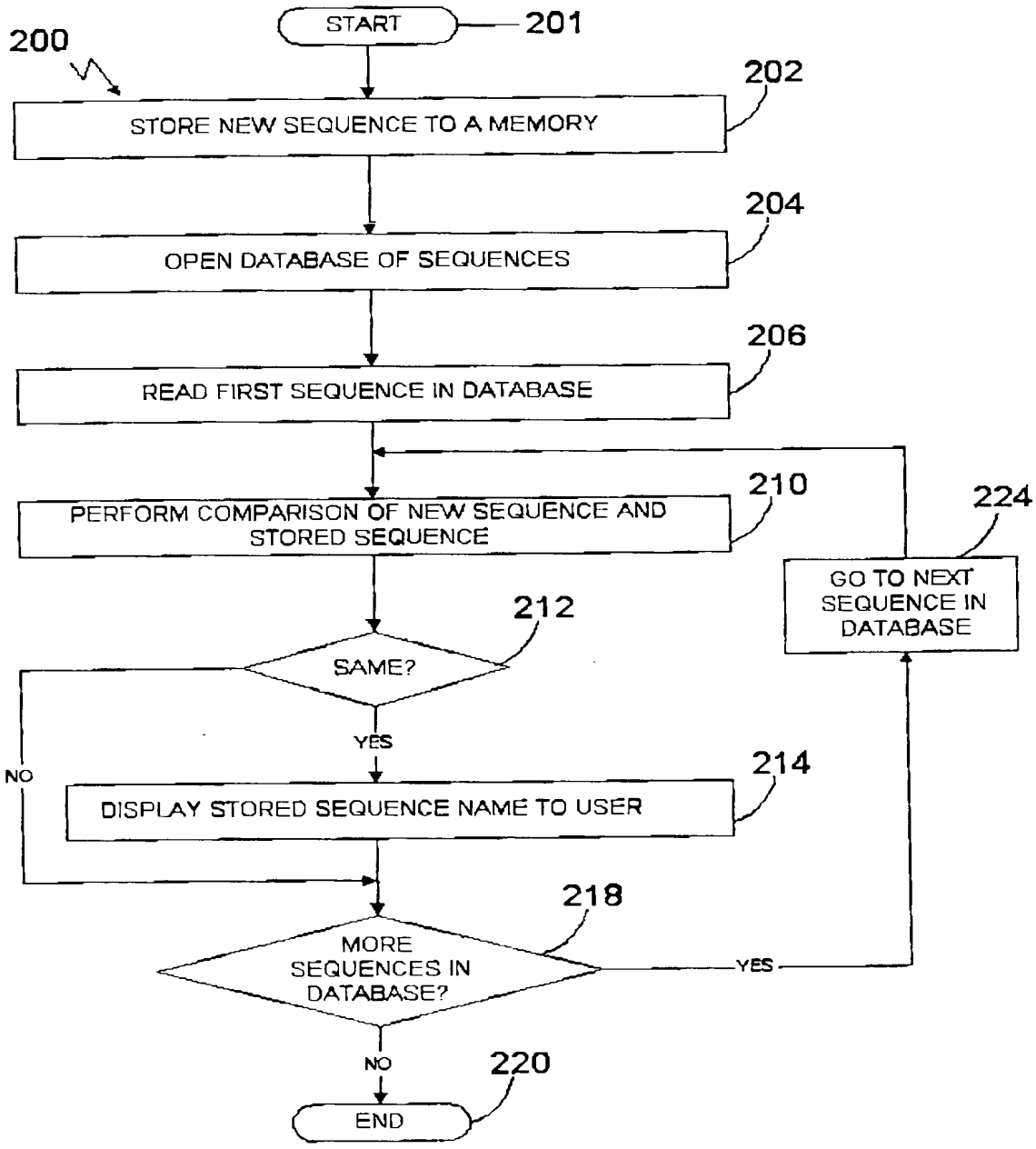

START
201
200
202
STORE NEW SEQUENCE TO A MEMORY
204
OPEN DATABASE OF SEQUENCES
206
READ FIRST SEQUENCE IN DATABASE
210
PERFORM COMPARISON OF NEW SEQUENCE AND STORED SEQUENCE
224
GO TO NEXT SEQUENCE IN DATABASE
212
SAME?
YES
NO
214
DISPLAY STORED SEQUENCE NAME TO USER
218
MORE SEQUENCES IN DATABASE?
YES
NO
220
END

FIGURE 15

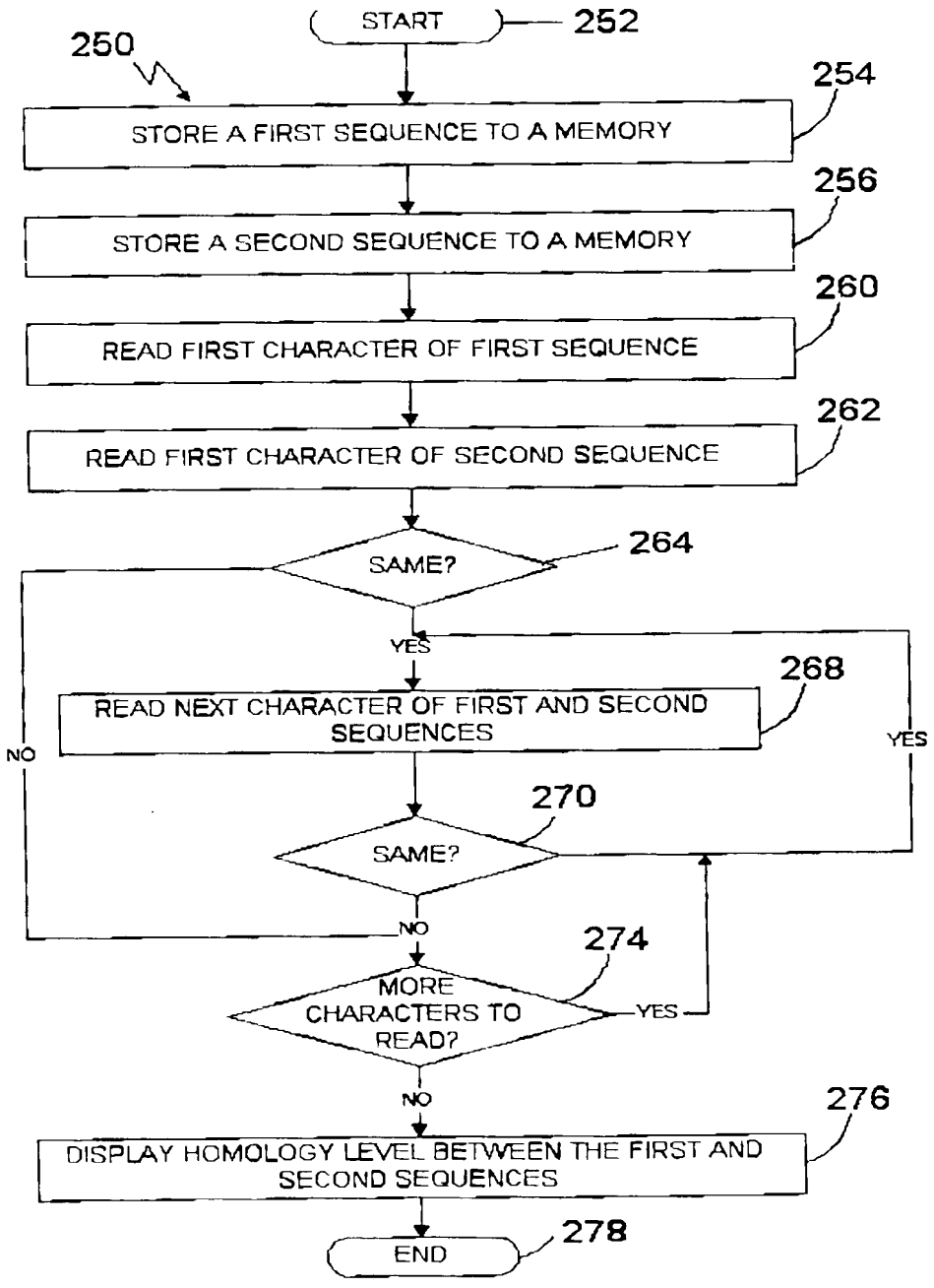

START
252
250
254
STORE A FIRST SEQUENCE TO A MEMORY
256
STORE A SECOND SEQUENCE TO A MEMORY
260
READ FIRST CHARACTER OF FIRST SEQUENCE
262
READ FIRST CHARACTER OF SECOND SEQUENCE
264
SAME?
YES
NO
268
READ NEXT CHARACTER OF FIRST AND SECOND SEQUENCES
YES
270
SAME?
NO
274
MORE CHARACTERS TO READ?
YES
NO
276
DISPLAY HOMOLOGY LEVEL BETWEEN THE FIRST AND SECOND SEQUENCES
278
END

FIGURE 16

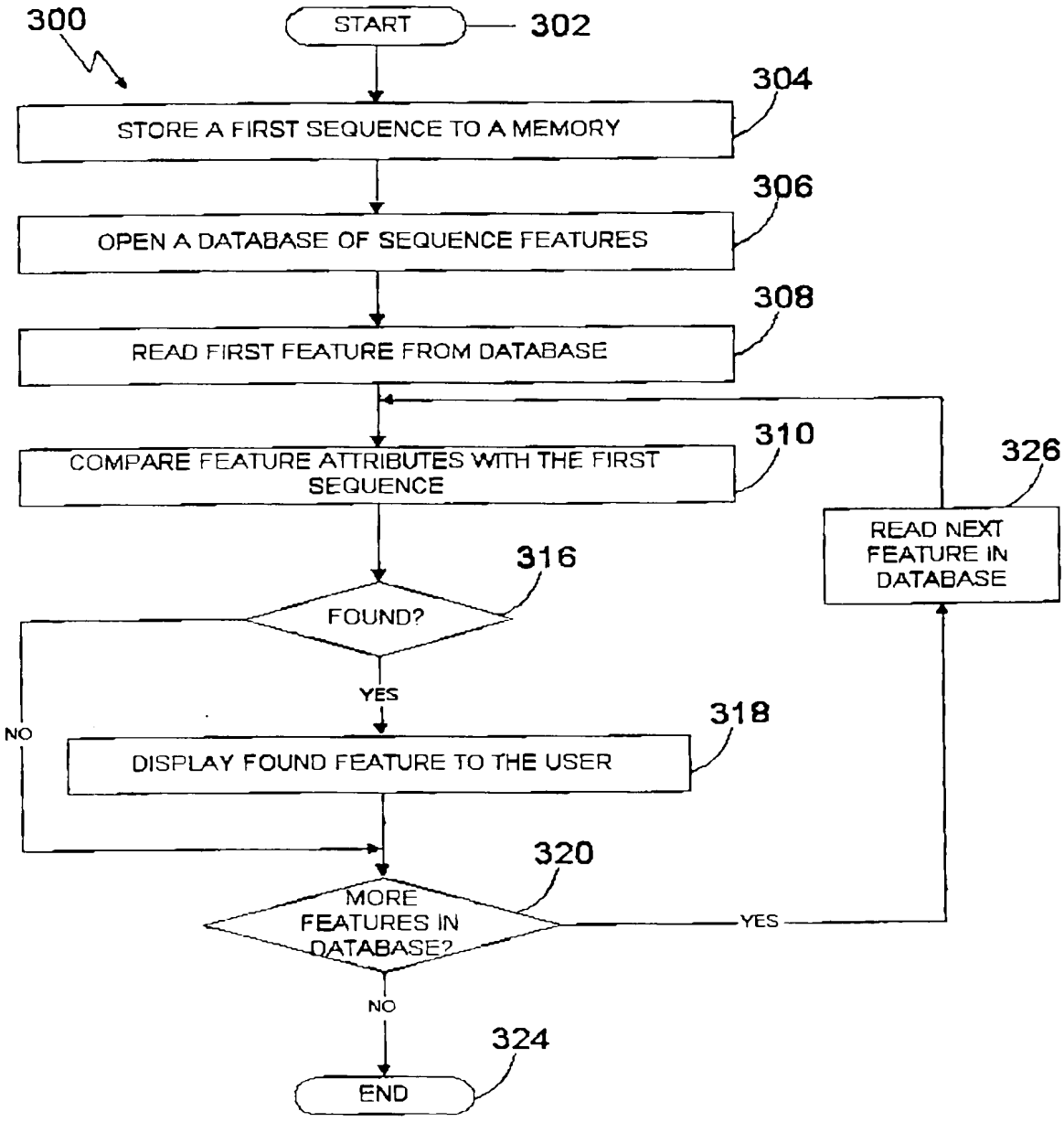

300
START
302
304
STORE A FIRST SEQUENCE TO A MEMORY
306
OPEN A DATABASE OF SEQUENCE FEATURES
308
READ FIRST FEATURE FROM DATABASE
310
COMPARE FEATURE ATTRIBUTES WITH THE FIRST SEQUENCE
326
READ NEXT FEATURE IN DATABASE
316
FOUND?
YES
NO
318
DISPLAY FOUND FEATURE TO THE USER
320
MORE FEATURES IN DATABASE?
YES
NO
324
END

FIGURE 17